Amarcordi,
tangible memory cues
for personal stories.

Master's Thesis
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Abstract

Personal memories shape individuals' identities and inform their decisions. Since the beginning of time, technology has been used to aid human's natural recall capabilities. The tools which are used to record them, have inevitably shaped and influenced not only how people remember, but also what they save. Digital media have provided great opportunities and power of handling personal memory collections, but have also introduced several controversies. The accumulation of huge unsorted digital archives is becoming inevitable: selecting pictures and files is now work rather than pleasure. Companies are starting to address this issue with new products and features, but this raises the question whether something so important as memories should be left in the hands of private corporations.

This thesis addresses the need to find motivation to curate memories from my past with a personal and artistic approach. It argues the importance of defining a strong objective to encourage such hard work. I achieved this through the realization of a physical and interactive project: Amarcordi. It consists in modular magnetic embroideries, each one representing a cherished story from my past. The visual and tactile language I designed represents not only people and facts, but also emotions and moods. Findings show the effectiveness of the project in inspiring me to recollect and reflect, giving me the opportunity to look at events through different perspectives. A surprising benefit was also creating an innovative way to share those cherished moments with dear ones.

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It is with some melancholy that I finish this thesis, which is now the last tether tying me to Aalto University. The MediaLab is such a special place in my heart, for the mood, the incredible lessons I learned, but especially for the people I met. Even if in different ways, from afar, I am still keeping some of those connections alive.

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Contents

1 Introduction

1.1 Thesis origin

In the summer of 2019, I found myself going through a collection of family albums at my grandparent's house. My grandmother was ill and bed-ridden, and I discovered that browsing through photo albums was a great way of spending time together. I also realised that I had not held one of those in a very long time.

My mother had the habit of selecting our digital photos year by year and printing them out in nice looking books. She stopped doing this 7 years ago. Her behaviour applied to the new digital media a familiar practice coming from analogue photography. However, she eventually changed her ways and stopped this selecting and curating activity entirely.

Our photo album tradition had slowly stopped, halting around the time smartphones appeared, defeated by the challenging effort of sorting through exponentially growing amounts of pictures. Another member of my family, my younger sister, never took up the photo album habit in the first place. She was born in 1999 and, by the time she had a smartphone and her collection of photos, they were a thing of the past.

These are examples of fast changing behaviour around the theme of memories and recollection. New digital technologies are a determining factor in the way matters are evolving. My thesis will start from this premise to investigate the implications and developments around this subject.

1.2 Goals and Research question

My goal was researching what role memories play in people's lives and in shaping their identity and the implications of losing the habit of curating personal collections. I explored the role of artefacts as memory cues, and ways in which the transition from non-digital media to digital archives has impacted the process of recollection. This thesis intends to evaluate how this shift occurred and what are its positive and negative influences on people's wellbeing, which are still unraveling and subject to change.

How can people be motivated to practise the hard work of curating their memory collections? I analysed why digital technology has made selecting our files and photos "work" and studied innovative solutions to bring back the pleasure of taking care of personal recollections. My objective was experimenting and seeking my own personal solution to this challenge, designing new ways of visualizing personal memories and stories.

In the scope of this thesis, I did not have the chance to apply my research to a project for a wider audience, but it remains a goal for further development. The findings of this work are a starting point for additional research and developments, providing precious insight and guidelines.

1.3 Thesis scope and structure

I based my work on literature from the fields of psychology, design and technology (Chapter 2). I studied what personal memory is, its relationship with media, and observed common practices and human behaviours concerning recollection. Studies showed me what is to be considered a healthy way of recollecting, and allowed me to form an opinion regarding which design solutions can hinder a person's wellbeing and which forms of interaction could become problematic in the long term. On the other hand, I discovered what ways of remembering are particularly helpful for identity formation and to inform people's actions.

I discovered where action on a designer's part is most needed in encouraging memory curation and analysed projects which have addressed this challenge. The theory and research allowed me to shape the goals and objectives of my project (Chapter 3). I came to the conclusion that I should foster the selection and recording of memories materializing them. This, as well as the need for a strong personalization and focus on the emotional elements of recollections, has given me strong boundaries in developing my project inside the scope of a master's thesis. I have come to the conclusion, given also the intrinsically intimate nature of autobiographical memory, that the best way to experiment and innovate in this matter would be framing it as a personal project. Having myself as the sole target, gave me the possibility to tailor the experience and aim for an output that plays on the edge of design, art and craft. I left scaling the experience for a larger public as a possible further development.

I tested whether my assumptions had been met through an autoethnographic approach, noting my thoughts and feelings regarding the objects I have created. I verified the results I had obtained in my investigation towards new ways of encouraging myself to practise a more insightful and meaningful memory curation, and obtained a new understanding to inform possible next steps.

To conclude (Chapter 4), I summarize my findings and suggest possible future developments for my research and project.

2 Context of the work

2.1 Memories

2.1.1 What are memories and why do they matter?

Photo albums, videos, souvenirs, these are all examples of media that we use to mediate our recollections. As an interaction designer, I am interested in studying how these objects are interfaces that put us in contact with the content: our memories.

We can distinguish between collective memory, the shared collection of historical relevant episodes of a group of people, and personal or autobiographical memory, the "image of who we are, mentally and physically" (van Dijck, 2007). In my work, I am going to focus on the latter, investigating the role recollection plays in forming our identity and knowledge. Personal memories do not just make us aware of ourselves and our past, they also change the way we interact with our surroundings, informing us on what actions we should perform and what we should not, what is good for us and what is not. They are fundamental for our self-growth allowing us to keep building upon our experience.

Another key aspect regards the interaction with others. As highlighted in the introductory example, looking at photo albums with my grandmother, recalling past stories, is an important bonding moment for my family. The ability to share personal memories allows strengthening relationships with others, giving credibility to our statements and raising empathy in our audience. Without common and shared memories, intimacy and social bonds would not be possible (Bluck, 2003).

Finally, the desire to survive is intrinsically part of human nature, even after we die: we want to be remembered, and to remember others who are dear to us. This creates the desire in people to write down their stories, pass along their knowledge and leave their legacy behind.

2.1.3 What shapes memories?

The process of remembering is an ever-evolving matter: our memories are quite delicate, malleable things. We are naturally driven to edit them and manipulate them for our own wellbeing. Research demonstrates that adaptations of our recollections create a biased portrayal of events in order to forget what hurts and disturbs us (Konrad et al., 2016). Examples of these natural processes include *positivity*, *rosy retrospection*, and *fading affect bias*.

Positivity consists in the tendency to selectively prefer to memorize positive events instead of negative ones (Walker et al., 2003). *Rosy retrospection* refers to the editing of facts themselves, in order to make them better than they actually were, and as time passes generally adaptively forget all the worst moments of a certain event (Mitchell et al., 1997). The feelings we associate to a certain memory, be they positive or negative, are also subject to fade in time and lose their emotional intensity

in a phenomenon called *fading affect bias* (Walker et al., 2003). This means we are constantly modifying our past in order to adapt it to the image we have constructed of ourselves in the present. A consequence of this natural tendency is that implanting false memories is actually quite easy. Studies have demonstrated that if people are shown a photo-edited picture of themselves in a situation that never happened, they are likely to acknowledge they remember it (Strange et al., 2005).

From the beginning of time, we have begun to aid our natural ability to save information through media. We can find the earliest forms of records on cave drawings from the Ice Age which were scratched and painted about 60,000 years ago (Frutiger, 1989). As centuries passed new tools appeared, and the way memory is saved evolved alongside the innovation of the means to record it. The media we use to save what happens in our lives is not just a sterile tool to transcribe, but brings along conventions and ways of encoding information that shape the memories themselves (van Dijck, 2007).

However, there is a duality on the role of technology in recording human memories. On the one hand, each technological improvement gave unprecedented abilities of saving more and more detailed and rich recordings of human life. These tools allow us to be free of the burden of remembering counting only on one'sbrain's capacity. On the other hand, technology has been seen as a threat to the purity of human recalling since the invention of writing (Plato, c.399–347 BCE/1997). Theorists such as McLuhan have welcomed electronic media, seeing it not as a substitute to human perceptual capacities, but rather as an enhancement of them (McLuhan & Fiore, 2003). For instance, photography and television are extensions of the human eye, audio technologies and radio of the ear.

Van Dijck (2007) argues that the solution to the dichotomy of memory and media is considering one as part of the other: objects constitute an intrinsic aspect of the act of recollecting since they unavoidably shape and determine our memories, informing them instead of transmitting them. For this reason she suggests adopting the term "mediated memories" rather than "mediation of memories". "Mediated memories are the activities and objects we produce and appropriate by means of media technologies, for creating and re-creating a sense of past, present, and future of ourselves in relation to others (Van Dijck, 2007)."

Mediated memories are not static in any way, they constantly evolve moving between the personal and the collective, the past and the future. The artefacts we collect, be they physical or digital, are not the memory itself, they work as a symbol which allows us to conjure recollection, that might be revised, modified or even deleted in time. A particularly emblematic case are the drastically different memories family members have of passed along photo albums. Also the items we collect as memory mediations transform in time, like photographs which fade, VHS or CDs that do not work anymore, or are directly edited by the owner. For instance, as a person changes in time he might eliminate things which do not resonate with his/her personal tastes anymore. Nothing is fixed forever in time, neither memories nor the objects we attach them to.

Memories are personal, but they are not always intended to be private. The need to share your memories with others is very relevant alongside the need to keep it for yourself. "There is not, nor has there ever been, a sharp distinction between private and public, but every act of memory involves a negotiation of these spheres' boundaries" (van Dijck, 2007).These are not set and are subject to change in time. They are likely to be revised, to be seen in a different light as time passes, or a person might

even lose control over them because of the lessening of cognitive abilities or death. Van Dijck (2007) explains that personal memory "entwines individual choice with common habits and cultural conventions, jointly defining the norms of what should be remembered". They constantly adapt according to the cultural habits, norms and conventions of our society, which define what should be remembered and how we should record it.

For instance, my family albums are full of pictures of special occasions, but only happy and festive ones such as weddings and birthdays. It is very hard to find photos of sad events and gatherings, such as funerals. This is the general norm for family pictures. However, if we take into account other recording media, such as a personal diary for instance, the habit regarding it is totally different. We are much more likely to write down something unpleasant or sad that happened to us. Different kinds of media are suited for diverse situations and have their unique cultural habits.

Van Dijck (2007) also explains that images and examples that surround us inevitably influence us. She mentions that collective memories spurred by mass media have become easily part of our personal collections. An example of this are television show recordings and music album collections my family keeps on their shelves. The opposite is also true, when for instance television shows use home media as footage (Marinello, 2020; Skofic, 2020) and when amateur videos become part of mainstream news (Sangiuliano, 2020). Van Dijck (2007) adds that smartphones have made such types of contamination much easier thanks to constant availability for capturing the moment and allowing fast sharing.

To conclude, mediated personal memories are much more than the archive of episodes of someone's life. They are shaped by the medium, by edits made by time and deterioration or by the owner's own desire to modify them, by the socio-cultural habits that surround an individual and by the exchange between the private and the collective.

2.1.4 The moments and ways we recollect

The dynamic nature of personal memories extends to the acts of remembering that involve them. Konrad et al. (2016) identify two distinct moments: *recording* and *reflecting*.

Recording refers to the process of saving our memories through media; this can happen through simple pen and paper as well as through the use of digital technologies. In the act of saving our memories, we are creating an enhanced knowledge of the events and aspects of our lives. Certain ways of recording memories produce a *savouring* effect. For instance, research has underlined the benefits of keeping diaries (Jose et al., 2012). Diaries have a wellbeing effect given by the possibility to underline the positive events and emotions in one's life as well as the chance to rationalise the negative ones and reflect upon them, understanding them.

Reflecting instead regards the act of looking back at our memories and reviewing them. It involves moments such as flipping through our photo albums, or re-reading old diary entries. For instance, studies have indicated how patients who were asked to repeatedly write about a traumatic event benefited from it, gaining emotional detachment and rationalising the fact (Pennebaker and Beall, 1986).

Do also digital media provide wellbeing effects through *recording* and *reflecting*? A study ob-

served people who were required to save and review, through a custom designed app, Echo, past memories on a daily basis and demonstrated that this kind of psychologically healthy dynamic process can be achieved also through the use of digital media, generating positive effects that continue to develop even months after interrupting the exercise (Konrad et al. 2016).

Analysing how the actions associated with saving and reviewing memory have changed with the transition to digital media, something which emerges is the lessening of boundaries between these two moments. For instance regarding photography, research underlines how the various behaviours associated to *PhotoWork* (Kirk et al., 2006), Accumulating, Curating, Retrieving, and Appropriating, have become much more dynamic and without clear limitations between them (Broekhuijsen et al., 2017). Users are likely to snap a photo, review it, browse the previous shots, delete some of them, take another photo. This is very different from the linear flow of analogue photography, as I will analyse in depth in a later section of this thesis.

Diving deeper into the benefits analogue and digital technology can bring to our process of remembering, Sellen and Whittaker (2010) determined five practices through which it is possible to analyse their advantages: *recollecting*, *reminiscing*, *retrieving*, *reflecting* and *remembering intentions*.

Recollecting regards re-living the past with the possibility to remember details that our organic memory lapses, such as features and names of people we have met, details of what has been discussed in a work meeting, as well as sounds and voices. Technology can provide help in remembering more details than we could possibly store naturally. The designs of tools to aid recollection should take into consideration the fact that there are strong connections between autobiographical memories and visual images, and make such assets the foundation of memory retrieval techniques.

Reminiscing involves activities of re-experiencing with a focus on the sentimental and emotional aspects. This kind of memory activity involves moments such as looking at old albums, or watching home video, and is enhanced by the sociality and the bonding that can take place through it. Design should take this into account emphasizing the possibility to share content and connect users.

Retrieving is more focused on the practical aspect of memory and the pragmatic need of accessing and finding digital information such as documents, emails, messages and webpages. Tools should be devised to allow browsing from a vast amount of diverse data and efficient ways of searching.

Reflecting implicates the value of looking at past experience in order to find cues for learning and forming self-identity. It involves a more abstract starting point, without an attention to detail, in order to ease reflection on the bigger picture. Reflecting on a memory might mean identifying patterns or looking at events from a different perspective. Design should support abstraction, and suggest innovative ways of changing the user's point of view, creating surprise and the chance to gain new insight.

Remembering intentions regards the memory of prospective events, in other words the intentions a person had in the past, for the future. The purpose of technology in this case is to provide reminders for users in a timely and focused manner, ideally aware of the context to maximise efficiency.

To conclude, research supports the benefits and wellbeing associated with reminiscing, underlining its great value both in practical matters as well as in emotional and self-improving ones. The identified principles can be of great help for designers in order to work on solutions that address a specific memory need in the most efficient way. They allow focusing on the natural ways of remember-

ing and integrating and helping organic processes through the means of technology. However, we must also take into consideration the sociocultural norms that surround our target users, in order to combine the natural benefits of remembering with habits and patterns that inform the content which is saved and their dynamic characteristics that go hand in hand with the fast advance of digital tools.

2.2 Memories and technology

2.2.1 How has memory/recollection changed with the advance of technology?

Since memory is intertwined with culture and objects, digitalisation has inevitably had an impact on the way we remember. Technology has advanced very quickly in the last years permeating our everyday lives with computers, smartphones and cloud archives connected to us at all times. We are going towards the *ubiquitous computing* reality theorized by Mark Weiser (1999). Our sociocultural norms have tried to keep up to speed since the tools for aiding our recalling have drastically evolved.

Those artefacts which used to be very tangible, which were subject to physical decay, have very suddenly become immaterial and virtually eternal. Their immateriality prevents them from fading in time and from being damaged by stains or dust. Bits and bytes provide a new strength and landscape which is not subject to the same rules as our physical world. However, even if bound to a different kind of materiality, the ageing of digital items is still a factor to take into consideration. The digital plane, software, is still dependent on physical hardware. The latter can be damaged exactly like analogue supports. CDs can be scratched, misplaced, or they can become incompatible with new devices. Technologies are prone to becoming obsolete; there is no guarantee of how long a certain format is going to be supported.

The precariousness of the Internet itself can be seen in the birth of projects such as the Internet Archive. The information on the web is so volatile that a need was felt of organizing a "wayback machine" to go back in time and see how it looked like in the past. "Like newspapers, the content published on the web was ephemeral - but unlike newspapers, no one was saving it" (*Internet Archive: About IA*, n.d.). Ironically, the intangibility of knowledge and memories has made its conservation more uncertain and fragile than before. The Cloud, where users can sync all of their files, entrusting companies to their safekeeping, takes away the burden of caring for the hardware themselves, but people should not be fooled by the misleading "cloud" metaphor: this technology relies on very tangible and physical servers nevertheless.

These services have made themselves indispensable, and convinced their customers that they will not have to worry about backups, about running out of space or losing precious files. Everything can be saved, versioned, and always accessible. However the cloud is still managed by people in the end, and people can make mistakes. A very stark example of the fallibility of these services was when in 2016 users paying for the PictureLife photo cloud service suddenly discovered they could not access all of their photos anymore and that they had lost access to them forever (Vogt, 2016).

Even if vulnerable, the digital does have an unquestionable advantage to physical mementos:

it occupies infinitely less space when stored. The archival space people have access to allows them to theoretically store everything they want. They can keep buying additional space for relatively low prices. If they are willing, they can easily keep upgrading their cloud accounts without ever facing the hard work of sorting what to keep and what to delete to make more space, avoiding such dilemmas as what clothes to give away.

Indeed, people keep snapping pictures, saving files, and eventually find themselves with so much data that another issue arises: how to retrieve content in a huge archive? Vast amounts of files require significant time and effort to be sorted and organized. Not having the time to do this, or deciding not to, results in the difficulty of finding something efficiently, or in the impossibility of retrieving it entirely. Looking at this issue through the lense of the moments of remembering, it is much easier with the advent of the digital to *record* memories, for instance carrying smartphones around makes snapping pictures and taking videos always possible. *Reflecting,* however, is not encouraged by the difficulty of sorting through huge digital archives, especially if looking at an infinite scroll of unsorted content where cherished data is side by side with unrelated or unwanted material.

Something that did not disappear with the transition from analogue to digital, and that was actually enhanced, is the possibility to edit our memory object, just as we edit our biological memory. We have the power of handling and modifying the very atoms of what constitutes our digital ephemera, which basically consist in lines of code, as long as you have the capabilities of doing it. Software has made it possible through visual interfaces with increasing immediacy, shifting in time the act of remodelling our files from desktop to mobile. Eventually though, the process of manually working to enhance our media is being made unnecessary in the first place. Photo-libraries such as Google Photos automatically enhance photos for us and create small video collages. Filters, algorithmic photo correction, and instant editing have appeared in apps such as Snapchat, Instagram, Facebook and TikTok. This enables us not just to record our memories, but to shape them. The boundary between memory and imagination is becoming thinner and thinner (van Dijck, 2007).

Edited pictures and videos can look so real, that it becomes difficult to understand when something was created by a computer. Beginning with Photoshop-edited pictures, now there are new innovative tools such as machine learning to generate believable photos and videos. Deepfakes have achieved incredibly realistic results, like the research synthetizing an Obama speech (Suwajanakorn et al., 2017), or Lil Miquela, the virtual influencer who people believed to be a real person, but then was revealed to be a project by a Silicon Valley company (Wells, 2018). In addition to this, there is an unprecedented possibility to experience mixed media, attaching memories to digital objects in multiple modes and media. A diary supports reminiscence only through writing, a photo album through printed photos, cassette tapes with recorded audio. Instead a single post on social media can include photo, caption and link to a music track on Spotify.

Another innovative dimension is metadata. The digital always comes with traces in the form of creation dates, often with geotagging and other forms of information that previously would have had to be manually labelled. This offers novel ways of retrieving information, since digital archives are automatically indexed and searchable. Sometimes, the data attached to our digital objects is visible, like the creation and editing dates of the files on our computers; at other times, it is invisible, like data collect-

ed by companies such as Facebook to understand which content we view the most, and hence what to show us (Jillian D'Onfro, Business Insider US, 2016). Again, there are more possibilities to handle digital memory objects, but at the same time a control loss regarding them. This is true also regarding the ease of sharing digital media.

As previously mentioned, one of the key aspects of memory keeping is the possibility to share our moments with others, opening discussion and confrontation, creating a sense of connection. With digital media, the pace at which we are able to create shared content is much faster than analogue media, if not immediate. The boundary between private and public has become much slimmer and the cultural perception of where that edge is has shifted considerably.

Privacy problems arise from this. Once digital media is shared, it is out of the original owner's control, and it is just as easy as that first step for it to keep spreading, and moving from a private sphere to a public one. The context in which a photograph is seen may change its meaning, and what a person might have been comfortable with sharing with a partner what s/he would like to show his/her friends. This has raised issues such as revenge porn, but also leaked celebrity private pictures. It also regards however more subtle circumstances, such as finding out personal pictures have been used to train AI algorithms (Crawford & Paglen, 2019). Once something has been shared there is no guarantee for it to stay private. Not only because of the other person's indiscretion, but also when it is saved to a company's server, you are placing your trust in them to keep it safe.

Since early modernity, people have tried to aim at total recall with concepts such as the Memex, "a device in which an individual stores all his books, records, and communications, and which is mechanized so that it may be consulted with exceeding speed and flexibility" (Bush, 1945). However, in order to reach a complete recording of the events in our lives, there is a need for advanced and pervasive technology for capture, as well as powerful hardware for storage and efficient tools for retrieval. Today we seem to have made all this feasible, but experiments such as Memoto and Google Clips that allowed advanced forms of lifelogging have failed (Peters, 2019). It seems that technology is getting very close, and even if life logging is not the norm yet, the subjects of our recordings have changed as the digital left the desktop and started being part of everyday life thanks to smartphones. Suddenly photographs and videos do not record only special events, such as weddings or holidays, but the ordinary moments of people's lives.

Social media have encouraged users to keep saving and sharing such personal moments, mainly because it creates a higher level of engagement between users (Jillian D'Onfro, Business Insider US, 2016), hence higher profits from advertising. Considering the natural tendency the human brain has to edit and introduce a positive-bias in what is remembered, the question arises whether it is unhealthy for people to have too detailed records of past events hindering natural processes such as *rosy retrospection*. Konrad et al. (2016) determined with their research through the use of the app Echo, that detailed recording upon which reminiscing is encouraged actually increase user's wellbeing. However, other examples show how a less controlled environment can create very opposite effects, like in the case of Eric Meyer, who had the Facebook's feature "On This Day" show him pictures of his deceased son (Meyer, 2015).

Hyper realistic memory also creates problems once we do not have control over it anymore, for instance in cases of mental deterioration and death. There are several issues regarding how one's lega-

cy can be passed on to our loved ones. On the one hand, accessing everything is problematic. Certain things we might want to leave to ourselves. On the other hand, in case of sudden death, having access to the google account of a deceased might be the only way to obtain precious memories. This is one of the reasons why many companies such as Facebook and Google started introducing the possibility to indicate a "legacy user", introducing concepts which are suddenly necessary as our digital identities become increasingly bound to our physical ones (Ziccardi, 2017). Ziccardi illustrates several strong arguments that have arisen in favor of a more precise legislation that supports the *right to be forgotten*, facilitating users in deleting with ease their online presence, be it their will.

In the opposite direction, our desire to survive and pass our knowledge along has led to the designing of concepts such as "mind uploading", referring to the practice, that is already being advertised by services such as Eterni.me. It goes beyond cryogenesis, building upon the overlapping of our life with our digital presence in order to re-create a copy of us for when we are gone. The aim of the project is to have the user save real time social media content and train an avatar of himself, a sort of advanced vocal assistant, that will be the interface that his/her heirs will use to retrieve information from the archive (Parker, 2014).

The possibility to record extremely detailed portrayals of the deceased, if not giving even the possibility to interact with their digital presence surrogate, has numerous controversial implications. The process of grieving might be a painful one, but it is necessary to move along and such clinginess to our everyday life of the presence of the deceased can hinder, if not block entirely, the possibility to distance oneself and accept their loss (Ziccardi, 2017).

Black Mirror dives into the deep dystopian and pathological problems which might arise with such practices of digital resurrection in its episode "Be Right Back" (2013), in which the protagonist, Martha, uses a new service that allows her to chat with her husband who recently died in a car crash, by uploading all her conversations with him training an algorithm to emulate him.This episode actually became partially reality when Eugenia Kuyda created Luka, an AI that was fed thousands of conversations between her dead friend, Roman Mazurenko, and friends and family who decided to contribute to the project (Newton, 2016).It allowed Roman's close ones to have another chance to talk to him, which in a way turned out to be valuable given his sudden death in a car accident, but on the other hand, raised several questions on the ethical side. The risk is that of developing an addiction as well as confusion which might truly hinder the process of grief and detachment.

All things considered, technological advancement, just as in the past, has given us the power not only to enhance our human memory capabilities, but also to evolve in many ways compared to the analogue tools it derived from. They mixed media, gave more speed, space, pervasiveness and versatility to our act of recording. Nevertheless, this has come with numerous problems and controversial questions, the implications of which have yet to be fully explored. In the scope of this thesis, it will not be possible to dive too deeply into all of the matters considered above. For this reason, the next section is going to carry out a more precise analysis which focuses only on the medium of photography and its evolution in the transition to digital.

2.2.2 A case study: how has photography changed?

How did the change occur from my grandmother's photo album to my sister's infinite scroll of unsorted pictures? How has the role of photography changed in the new digital age? These questions, and the shift that occurred in the behaviours surrounding this media, have been central to my research since photography is my most adopted mnemonic tool. I feel it is the easiest to use, access and archive. I also believe people's digital lives are mainly surrounded by visual inputs. This supported my desire to proceed further with an image-based analysis.

Firstly, what is the role of personal photography, as in amateurish and non-professional? It has seen a significant shift since its invention and, later on, since my grandmother's time. It used to be a media of great importance for remembering how life was, how people and places used to look, and to leave a personal legacy of a family's history. It also had the secondary functions of identity formation and communication with others, strengthening social bonds (van Dijck, 2007).
Examples of such memories are family portraits, special gatherings like weddings or christenings, honeymoons and holidays.

The digital era has drastically changed this. With the diffusion of smartphones, it has shifted from a tool of self-preservation to one of self-presentation: the individual has taken the family's place as the focus (Harrison, 2002). Van Dijck (2007) supports this thesis underlining how "the laminated print is an object to hold on to, whereas the digital picture appears to be an object to work on and distribute". This becomes more evident when underlining the evolution from a tool to represent family special moments, to one to portray and share everyday personal life.

Cameras are objects that people bring with a specific purpose, for a trip, when visiting someone or some place, when something special occurs. Smartphone integrated cameras on the other hand, are always carried around and are available anytime during everyday life moments. Furthermore, smartphones through wifi and data connection, allow for instant sharing of media. Snapping a picture does not cost anything, and is often faster and more detailed than words. The habit of taking a photo or screenshot with the sole purpose of sending it to someone, without any desire to go back and review that image, has become diffused.

Another aspect of digital images which encouraged the shift to being a tool for identity formation is the fact that it puts people more in control of crafting the end result. Smartphone selfie cameras eliminate the in between filter of the delay in reviewing the photo and the photographer himself. The individual can have total power of manipulation of the framing, the light, the setting, as well as over the review and editing and refinement of the final shot. This all takes place in the moment of the shooting, no need to go back to a photo studio or to a laptop. In addition to this, taking good photos for amateurs has become increasingly easy. Software, in the form of *computational photography,* has filled in the gap where hardware could not fit on a sleek phone, creating refined forms of automatic algorithmic image enhancement (vas3k, 2019).

Another aspect is how diffused and immediate editing has become, and since photos usually have a good quality definition thanks to the advanced auto enhancing, more experimental, fun and interactive kinds of filters have become largely diffused on all platforms, from Snapchat filters, to iOS Memoji.

This allows for a completely different level of power for crafting the image one wants to construct of him/herself. The final product becomes "a mixture of memory and desire" (van Dijck, 2007).

Lastly, there has been a noticeable change regarding the number of pictures being taken on average. Laminated photos had a price, digital ones do not, at least in the immediate future. Once a person, snap after snap, fills his/her phone memory, often an annoying yet too familiar message appears: "Cannot Take Photo. There is not enough available storage." As annoying as buying extra Cloud storage may be, it will allow far more new photos than a new roll of film and for an undoubtedly lower cost per picture. Yet, once the full storage problem is solved, what happens next? The next section is going to analyse more in depth the implications generated by accumulating vast personal archives.

2.2.3 Issues of huge archives

Studies have inquired about how people perceive their digital photo archives, and have found that having too many files and not being able to select and organize them is a largely felt problem (Axtell & Munteanu, 2017; Broekhuijsen et al., 2017; Sellen & Whittaker, 2010; Stevens et al., 2003). Broekhuijsen et al. (2017) found that participants in their study were not successful in 40% of the photo retrieval tasks they were asked, and the long amount of time it took for people to find pictures (an average of 4 minutes) was given by the vast amount of material they had to browse through.

Companies, such as Apple and Google, have started to address the challenge of helping users retrieve their photos through features like image recognition and keyword based searches. Someone can look for their last trip to the "mountains", or the picture they took of some "food" they cooked: the algorithms have become very efficient in finding them. This feature is still quite recent and has a very different search logic from what people were used to with manual organization of files. However, also more familiar interactions are supported, like advanced chronological or location based searches.

The frustration of looking for something in a large archive is exactly the same as in the physical landscape: people are put off by large boxes of cherished objects and will not take the time to go through them (Petrelli & Whittaker, 2010). Not being able to see the mementos prevents casual contact between the object and its owner, hindering possibilities for remembrance. Curating can be identified as key to other activities involved with remembering, but digital products and solutions seem to have addressed mainly efficient search and retrieval rather than fostering positive reminiscence (Broekhuijsen et al., 2017; Jansen et al., 2013; Stevens et al., 2003).

Stevens et al. (2003) argue that, in order for people to face their huge archives and practice the needed curation, it is necessary to remove the "work" part from it. They support the need for natural interactions and an interface design that encourages storytelling to motivate people to engage with their archives. The implications of not taking action in this direction to gain back the control of digital archives can be seen in the experiences of mothers today realising that their millennial children will be a "lost generation" (Llewellyn Smith, 2019). They feel the guilt of having their sons and daughters grow without photo albums, knowing all the hundreds of photos of their childhood will be buried at the end of an infinite scroll they will never bother to explore.

Losing access to selected mementos of one's past experiences will harm *reminiscing*, the process of looking back and re-living a specific experience, but not as much as it will prevent *reflecting*. This activity of learning from past behaviour, forming one's self-identity, is based on looking at the bigger picture and finding patterns (Petrelli & Whittaker, 2010). It requires selection and abstraction in order to look at events from a different perspective. I see the need for curation especially for encouraging this process, in particular since it is the most vital to form an impression of who we are and to inform our future decisions.

2.3 The future of memories

2.3.1 What could memory curation become in the future?

Digital mementos have not entirely taken the place of the physical yet. People seem to perceive objects more easily as cherished when tangible rather than digital (Tsai & van den Hoven, 2018). Forms of curation like keeping photo albums are still a practice for many. Even if my mother gave up organizing and printing our digital photos, other people did not. It is however clearly a nostalgic habit nonetheless.

As discussed, the archives have become so big compared to the analogue days, and with so diverse content, that serious patience and dedication is needed to clean and select them. To do so, proper motivation is needed. Studies show that it is easier for people to do the hard work of curating when the end purpose is clear (Broekhuijsen et al., 2017). For example, my millennial sister found exciting and pleasant organising and printing pictures of her and her boyfriend for his birthday present. When I asked her if she would enjoy doing that activity once a year she was baffled by the idea. She said she would not want to do it more than a couple of times in her life. Companies providing photo storage, for example Google Photos, seem to still perceive a desire in their users to print their collections and provide in apps features that allow a quick export and printing service.

Even if there is a general decline to this medium, there is a type of printed photo that continues to enjoy great success both with the nostalgics and with new generations: the ones printed by Fujifilm Instax cameras, Polaroids or other similar devices (McHugh, 2018). While DSLRs and other digital cameras have seen a decline in their sales, these bulky devices have a great appeal for different ranges of users, and have given new life to laminated pictures. It seems there is a strong sense of nostalgia for printed photos and the easiest way of going back to them is bypassing completely the whole digital framework. There is the appeal for something simpler, but also for the social aspect of having a tangible memento to hold on to and share; to see hanging on someone's wall instead of browsing through the photos of a device.

Is avoiding our digital archives altogether the only way to have a selection of our memories? Actually, it seems people are quite able to find the motivation to practise digital curation in one specific situation: social media. Users post all kinds of media to express their personalities, their life and habits, and the things they like (Sung et al., 2016). They build a digital showcase of themselves that is shared with friends, acquaintances or the public. People are motivated to select and refine their digital mem-

ories for an audience, but find it hard to do it for their own personal private benefit. However, what is shared on social media is very far from the real image of oneself. It is a happy mask that portrays an unrealistic identity, if not at least partial. People present themselves online according to what will be best received and commented by others (Schlosser, 2020). The one place where people are putting effort into curating moments of their lives is a situation in which there is an unrealistic and skewed picture of them.

Facebook, Google, Apple and other digital companies have seen the struggle users face with managing their archives and have designed features in their services to address the user need. Instead of encouraging curation however, their efforts are pointing in a different direction: have algorithms take the burden away from their users entirely. With features like "On This Day" by Facebook, users get suggestions of content they shared or uploaded on the platform in the past that they might enjoy remembering. Basically they studied an AI model that takes into account what content users are going to enjoy if reminded about it, and then show it to the users on top of their feed (Prey & Smit, 2018). This is part of a greater scheme to have people share more personal content on the platform (Jillian D'Onfro, Business Insider US, 2016).

Prey and Smit (2018) highlight the fact Facebook and other companies are handling processes of memory retention and the consequences it might bring. If people delegate to them the control of what they remember and what they do not, what does it imply? Does it mean such platforms can influence our identity and how we will act in the future? Researchers do not have answers to these questions yet, but indicate a clear need for attentive criticisms towards the diffusion of such features.

People, however, are still not ready to allow an algorithm to control their memories. Research indicates the need for a quality in the selection of their photos which they would not entrust a machine with (Broekhuijsen et al., 2017). It seems Google is still willing to try. In September 2019, a new trial service was launched, allowing users to have an algorithm pick and print for them their private photos each month (Li, 2020). Users can customize their general preference of "Mostly people and pets", "Mostly landscapes", or "A little bit of everything" and leave all the rest to the machine. It is yet to see if this will become an actual product, and if the outcomes of the algorithm choices are more sophisticated and satisfying than those of the discontinued Google Clips project (Burgett, 2017).

When thinking of a future in which people totally depend on algorithms, and the companies behind them, for the curation of our memory, additional questions arise. If it is so easy to manipulate memories, and create false recollections based on pictures, how easy would it be to edit those chosen by AI? Could these companies change people's behaviours and actions not just as humans, but also as customers? Could they manipulate for a profit using memories, such personal and cherished data? Furthermore, as Sherry Turkle points out in her talk *Connected, but alone?* (2012), since a machine has not lived, how can it make certain emotional choices for people? How can it have the ability to empathize? A stark example of this is a painful resurfacing of memories which hurt, like the pictures of Meyer's deceased daughter which slipped through the filters he tried to apply, forcing him to deactivate the "On This Day" feature entirely (Meyer, 2015).

Algorithms might be the answer to the issue of digital memory curation, but they are not the only one. Several projects have studied ways of encouraging curation and new ways of recollecting. The next section will analyse some of the most significant ones in relation to my work.

2.3.2 Related projects

Different studies have tried to tackle the issue of taking away the "work" to memory curation, or at least finding strong motivations for people to do it. I have selected some of the most significant examples of prototypes and projects that have brought new light on the subject, given me deeper knowledge on the matter or inspired me in choosing a certain direction.

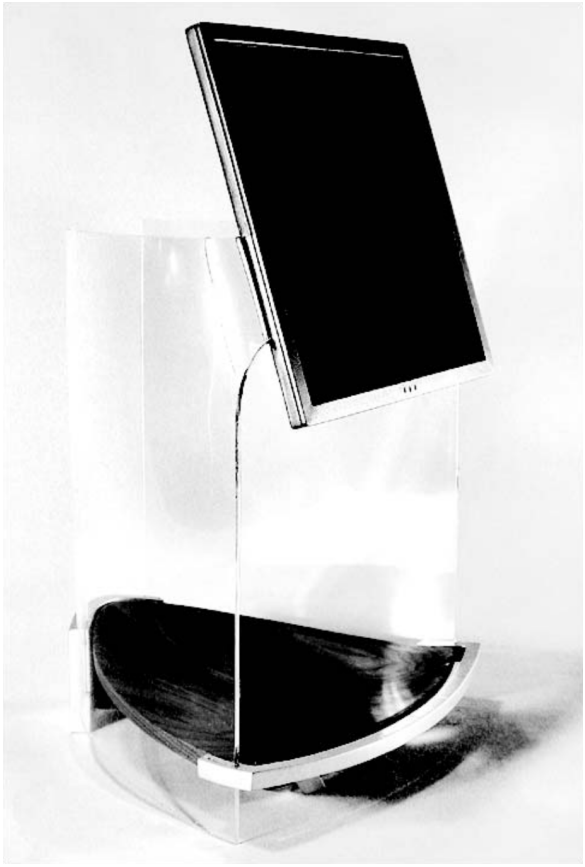

Figure 2.1: The physical model of the *Living Memory Box*. Designed by Florian Vollmer. Stevens et al., 2003.

The *Living Memory Box* by Stevens et al. (2003), is a research project that created a memory box (Figure 2.1) where people could place artefacts to record personal stories and later reproduce them. In addition to this, metadata of the time and place of capture was saved to avoid the manual work of annotation.

From the research, a clear goal was developing natural interactions to enable storytelling through a centralization of artefacts. Feedback from the users indicated a strong appreciation of making the process of recording somehow therapeutic. This was encouraged by the appeal of interacting with a physical device. Bringing users away from a computer, into the physical space, and giving the possibility to interact with natural interactions such as voice and touch, allowed participants to develop stronger emotional connection with the experience and feel less like they were performing a job.

Hermans et al. (2017) developed a project addressing teenagers and how to connect their virtual and physical cherished possessions. Creating a bridge between these two realities gives stimulating opportunities especially since they are both very important for this age group to form their identity. The goal was testing innovative ways to create personal moments of recollection based on augmented jewellery. They created *Memora*, a prototype (Figure 2.2) including a bracelet that allowed the participants of their study to select a special memory to embed in each bead, re-playing it through a special stand attached to a screen in their home. Each bead could have associated only one digital photo, which could not be edited.

Figure 2.2: The second iteration of *Memora*. The display stand that reads the beads on the bracelet and creates a random collage of the photos on the screen. Hermans et al., 2017.

The findings showed an appreciation for the physicality of the interaction and the creation of such a personal and intimate experience. It encouraged attaching memories to the beads that had not been shared publicly on social media and were meant to remain private. This is one of the reasons why its ordinary look was seen as a positive fact, revealing the added value behind it only when wanted. It was the stories associated with the beads that came into focus, rather than the digital pictures themselves.

The opportunity to find the most cherished memories and not risk losing them was also greatly appreciated. Something which was indicated as a possible improvement was the chance to add more personalization to the physical artefact. In fact, *Memora* offered a significant aid in enforcing and presenting one's identity, while at the same time maintaining an intimate relationship with the personal memories.

Also Jansen et al. (2013) felt there were not enough modalities to enjoy and share recollections starting from digital photographs compared to analogue ones. Their work focused on the act of giving more importance to certain memories rather than others, operating a positive selection, in order to expose favorite moments making them emerge among the multitude of data. For this reason, the researchers invented the concept of *Living Media*: media files fade progressively when neglected, while the most viewed ones are bright and vivid (Figure 2.3). The design aimed at emulating the natural behaviour of human memory, slowly erasing what is not meaningful and seldomly reviewed. It encouraged therefore a process of selection, decreasing the amount of material, a necessary step to encourage sharing, the main goal of the study.

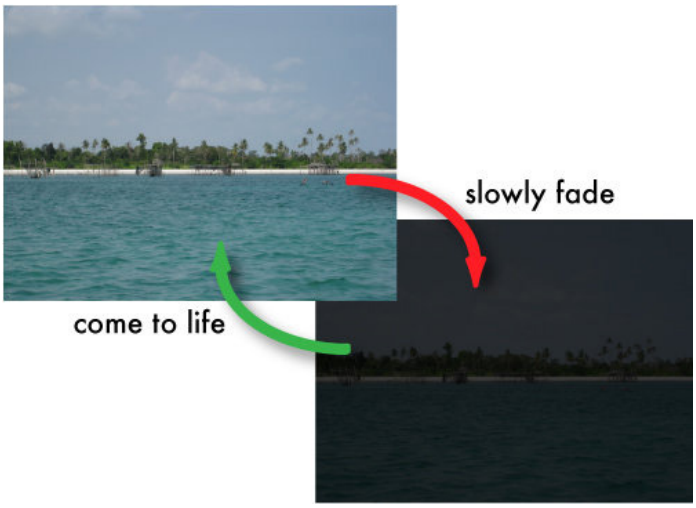

Figure 2.3: Living Media Concept. Figure 2.4: *Pearl Concept.* Jansen et al., 2013.

To put the theory into action, the researchers produced a prototype, *Pearl* (Figure 2.4), that aimed at fostering recollection and sharing, bringing the digital into the physical space. They used pico projector technology to display a collage of selected images on a wall in the room, and allowed natural interactions such as touching the projected photos to refresh them and dragging them out to remove them.

Feedback by the participants was positive towards *Pearl*, seeing its potential to view photos, which are normally hidden in their digital collections, and enjoying the process of selecting in a more playful setting than usual. There were mixed feelings about the *Living Media* feature: it was seen as interesting but many would rather not see faded images in their projected collages.

An alternative to chronological oriented storytelling could be location based narration. Google has introduced new features in Google Earth suggesting how annotations on their app could become a new way of encouraging memory recording and recollection (Figure 2.5). In this case, rather than bringing the digital into the physical world, it is instead the detailed portrayal of our surrounding landscape that becomes embedded in our devices.

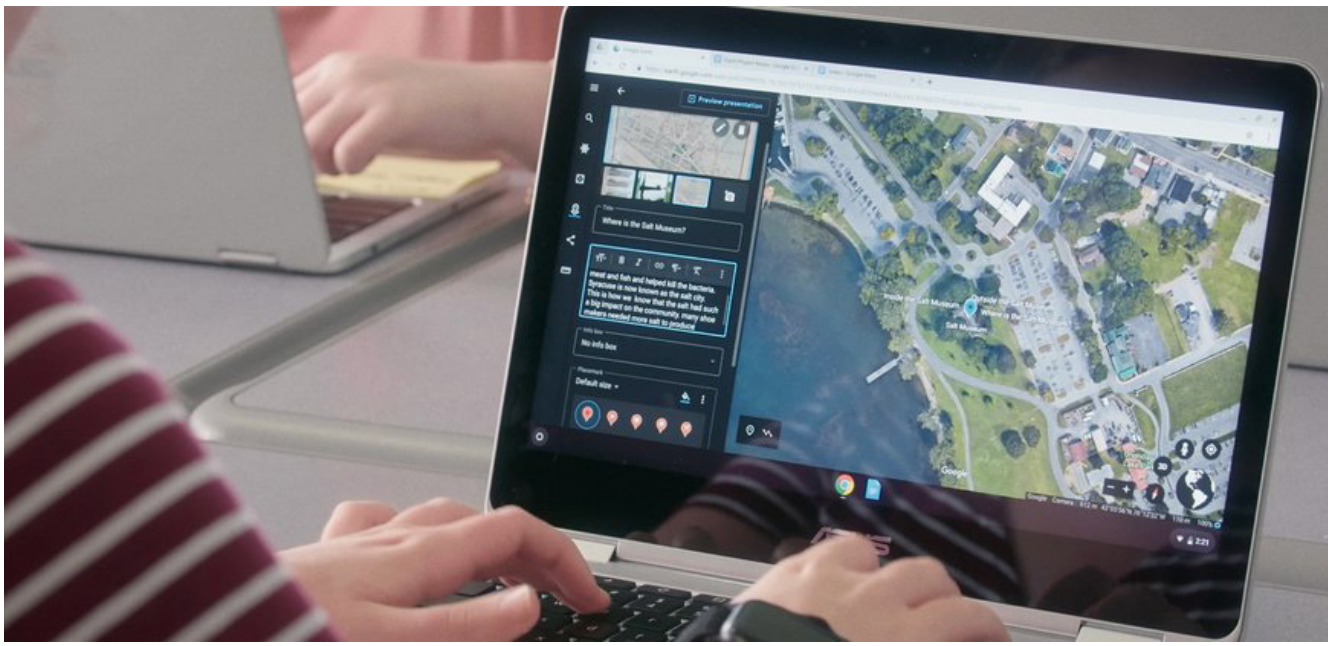

Figure 2.5: Google Earth interface.
Downloaded from: https://www.blog.google/products/earth/new-google-earth-creation-tools/

I decided to branch out my research for alternative ways of recording personal memories, going further than photos and audio. I began looking at artisanal techniques which were used as an alternative to writing, to record people's stories. I was interested in observing art, craft and needlework examples since there is a strong connection with new media practices such as creative coding. For instance, there are strong similarities between the rules, organization and repetitiveness of woven and stitched designs and the 10 PRINT program of a Commodore 64 that visualizes generative patterns: the aesthetic value of both practices derives from the balance between grid, pattern repetition and variation (Montfort et al., 2013). Montford et al. (2013) state that "the parallels between teaching needlecraft and programming are striking" and that "the personal computer is a site of procedural craft", where the main difference lies in carrying out the repetition automatically rather than manually.

I found the most interesting examples of woven craft in Latin American traditional techniques. An interesting ancient practice was that of the Yakama Time Ball (Figure 2.6). This first example does not refer to weaving but to the creation and use of thread itself. Women from the Yakama Native American tribe made personal diaries adding knots, beads or shells to hemp strings. Each of these represented a major event in their lives, which were then all wrapped into a ball.

Figure 2.6: mnemonic device called *Ititamat*, or *counting-the-days ball*, or simply *time ball*. Created before 1920. Downloaded from: http://dataphys.org/list/yakama-time-ball/

Figure 2.7: Tapiz, Chancay o Chimú, 1000 – 1430 DC. Wall tapestry. 880 x 550 mm. Image courtesy of Museo Chileno de Arte Precolombino.

Figure 2.8: Pelícanos, Chimú, 900 – 1470 DC. Wall tapestry. 1810 x 1050 mm.
Image courtesy of Museo Chileno de Arte Precolombino.

The weaving tradition offers also figurative examples, using thread to give shape to symbols and pictograms that narrate a story. An example are Latin American tapestries in Figure 2.7 and 2.8. These show a clear theme and variation creating mesmerizing patterns. They offer a mixture of figurativeness and geometric abstraction.

Contemporary artists are still using weaving techniques. One of these is the British artist Hannah Waldron. She produces woven pieces that encode personal stories and places in a visible grid, creating beautiful graphical representations (Figure 2.9, 2.10). In an interview Waldron (2013) explains her style:

"I am interested in the reflection and mapping of experiences particularly in relation to places. I draw upon a personal visual vocabulary of forms and mark-making that aim to distill information into its most essential with the aim to make images that communicate broadly and that might lead to personal interpretation."

Figure 2.9: *To Houshi Onsen.* Weaving. From the Map Tapestries series. Hannah Waldron, n. d. Downloaded from: https://www.hannahwaldron.co.uk/.

Figure 2.10: *Sisters.* Weaving. Hannah Waldron, n. d. Photo: Paul Plews. Downloaded from: https://www.hannahwaldron.co.uk/.

The use of computer programmed knitting has allowed other innovative uses of weaving. *Abstract_* is a project by Bjørn Karmann in collaboration with Julie Helles Eriksen and Kristine Boesen (2015) (Figure 2.11, 2.12). Their goal was giving a new personalized way for customers to connect with the clothing they buy. *Abstract_* asks people to write down a personal story and, while they do it, analyses the rhythm of writing and the facial expressions. From this data a pattern is generated, influencing the shapes and colours, creating a unique garment. This sees the potential of generative art in creating original pieces that can be created thanks to very personal user inputs.

Figure 2.11–12: *Abstract_*, Bjørn Karmann, Julie Helles Eriksen, Kristine Boesen, 2015. Downloaded from: http://bjoernkarmann.dk/abstract_project

Generative design is a machine programmed version of what data visualization can do with, in certain cases, an additional human touch. Giorgia Lupi's work focuses on bringing to data visualization the human side of things. In her project *Bruises* (2018)(Figure 2.13) she collaborated with Kaki King to tell through art and music the story of Kaki's daughter's disease and what the family went through during treatment. Rather than depicting a scientific representation of data, this project focuses on the emotions and story itself as it articulated during four months of a very troubled time of a family's life. Lupi visualises lab results, the amount of bruises on the child's body, medications, but also when Kaki was away from home, positive moments, her level of fear and hope.

Figure 2.13: *Bruises*, Giorgia Lupi, 2018.
Downloaded from: http://giorgialupi.com/bruises-the-data-we-dont-see

Acrylic Friends by Laurie Frick (2018) shows a different approach to data visualization and remembering people in her life. She made a physical visualization with colourful acrylic blocks, each representing a friend (Figure 2.14). Each piece did not indicate the name of the person in question, but instead a short sentence reporting an interesting fact or effect they had on her. The plastic blocks are piled together and the viewer can look through their transparent material. Colours seems to add an additional level of information, but it is left to the viewer to decode it.

These examples show how natural interaction and physicalization can bring additional value to the moment of recollecting. They also give interesting suggestions of techniques and modalities to encode stories. Should only the "data" of the story be recorded, the facts and figures, or also the rhythm, the emotions and feelings associated with them? Should recollection have a fixed modality, or should we give freedom to choose between location, event, people and emotion based browsing? I will address and answer these questions in the next chapter of this thesis, describing my own project.

Figure 2.14: *Acrylic Friends*, Laurie Frick, 2018.
Downloaded from: https://www.lauriefrick.com/new-gallery/aczge9o9lfgjp11lkm44r6mn238fkn

2.4 Theory summary

Memory and recollection are important, they determine our identity and inform our actions. Reflection allows us to look at ourselves and acknowledge who we are and who we want to be. It is important to keep it in mind since technological solutions have largely aimed for efficient upload and retrieving instead.

People's huge digital archives are not going to become any smaller. My argument is that digital companies are taking advantage of our struggle and making themselves essential to resolve it. The issue is people will become dependent on them and will not have much choice but trust them, not only to store their files, but also to be reminded of their past.

Research and design are of great value to work towards discovering new innovative ways to make selecting and displaying our memories a more pleasant, playful, social, emotional moment rather than hard work. The projects I selected and illustrated are all trying to encourage storytelling in novel ways, either through tangible interaction or through creative visualizations. My own work is going to develop further this concept and try to research further new ways of curating personal memories.

3 “Amarcordi”, tangible memory cues

3.1 Goals

3.1.1 Motivate memory curation

From my research, a driving factor to make curation an enjoyable act is having a precise goal in mind (Broekhuijsen et al., 2017; Jansen et al., 2013; Stevens et al., 2003). This could be, for example, preparing a gift for someone, sharing it with the rest of the family, or with social media friends. It is important however, that when a selection of memories is made, it displays a true personal history, and not the sweetened version one might present to a public (Schlosser, 2020). In other words, the target to aim for should be internal and private. While sharing memories is significant to create social bonds and has great value for individuals (van Dijck, 2007), I will not concentrate on the connection that can happen with a wider public, but on that which can be encouraged in a private setting with close relatives and friends.

Another strategy to encourage curation the literature highlighted is designing for a precise moment of remembering, focusing efforts and enhancing the derived benefits (Sellen & Whittaker, 2010). Since it underlined a lack in tools concerning especially *reflecting*, the act of looking back and finding insight to learn and form self-identity, I decided to make it my focus. This type of process requires having an overview over your past and the possibility to see patterns and look at events from a different perspective. Abstraction and synthesis helps this activity and requires that the quality and type of content is carefully chosen. An algorithm cannot do this, it has to be an individual deciding for him/herself what stories represent him/her.

An overview over past memories should not only be seen through chronological order. To see things in a different light, organizing data around places, events or people could be more effective ways to look at past events (Brewer, 1988). Studies have pointed out that breaking the usual temporal timeline can foster recollection and storytelling (Axtell & Munteanu, 2017).

In many of the projects that try to address digital collection curation, a key element is the effort of materializing people’s memories. In studies, when inquiring what objects were the most significant in the participant’s home, digital ones were rarely chosen (Petrelli & Whittaker, 2010; Tsai & van den Hoven, 2018a). Tsai and van den Hoven (2018a) argue that the traces of time and usage of physical objects create a stronger emotional value and attachment. In addition to this, these imperfections and signs make them unique and irreplaceable. Petrelli and Whittaker (2010) also note that while digitally stored files are invisible to the eye until retrieved consciously, physical objects surround people in their homes, are integrated in everyday life and give the opportunity to create contact. If there is no interaction, there is no chance to develop a deeper meaning.

Physical mementos take away the need for a graphic user interface between people and their memory cues. Picking up a device, unlocking it, closing previously opened applications, opening an archival app, spending several minutes searching for the desired picture or file, these are all inevitable steps people are faced with using interfaces that lie behind a screen.

As literature theorised already in the 90s, our reality starts to take characteristics of *ubiquitous computing*: objects around us are being connected to the internet and people are finding themselves at the centre of complex data collecting networks. As Norman (1998) argued, computers have reached a maturity requiring a design that keeps in mind the need to simplify and unburden the user of information overload. In 1996 also Weiser and Brown suggested the need for *calm technology*, that moves most of the processes to the periphery of the user's attention, keeping what is important at the centre, at the right time. This can be achieved with graphic UI, but as Krishna (2015) argues, often the best interface is no interface. What if the aim is taking all the above mentioned steps to reach their memory cues, and removing them entirely? The most straightforward process would be desiring a moment of recollection, and looking at the relevant memento. My project is going to address ways to make remembrance more immediate and frequent through the materialization of memories.

3.1.2 Bringing memories to the physical world

How do you materialize memories? Some of the related projects I analysed and my research have given me precious insight regarding different design paths that can be taken. Firstly, personal stories are going to be the focus. Instead of starting from a specific digital media to physicalize, I am going to go to the source of the recollection itself. This gives the benefit of being able to give shape to events and situations that have no other form of recording.

Starting from human memory also allows me to shift the focus rather than from a particular sense associated with a medium, vision for photos for example, to the emotional content of that particular story. I want to create a strong highlight on the emotional connection people have with their memories because it is a dimension too often kept unseen in digital and physical mementos. However it is just as important as the visual detail digital media can give us, if not more.

Research has shown how traces of time and personalization can increase the emotional value of objects (Petrelli & Whittaker, 2010; Tsai & van den Hoven, 2018b). For this reason, rather than taking a generative design approach, in which the final output is co-created by the collaboration with a machine, I want to aim for a hand-made artisanal design. Weaving, drawing and sculpting memories by hand seems to give the possibility to create a much stronger emotional bond with the final output, having total control on the shapes and forms it will take, touching it as it takes shape.

Working with physical matter gives some creative constraints. It means space is a much more tangible and finite limitation than with digital media. Bringing the experience outside of the huge archives requires selection, curation and synthesis. Rather than details and multitude, I am going to encourage abstraction and quality. My project will aim at providing an overview of one's memories, fostering reflection (Sellen & Whittaker, 2010).

3.2 Project scope and framing

3.2.1 Framing my work

I decided to develop a design project that would allow interfacing with personal memories through the materialization of them. Having a precise goal in mind has proved to motivate the hard work of selecting recollections (Broekhuijsen et al., 2017; Jansen et al., 2013; Stevens et al., 2003); my research wanted to test if making physical artistic memory cues could be this goal, motivating memory curation. I named my project *Amarcordi*, quoting Fellini's famous movie *Amarcord* (1973), whose title comes from the Italian dialect "a m'arcôrd" which means "I remember". The title has since become a neologism to indicate nostalgic recalling.

I decided to aim for a physical output because people are more likely to create emotional ties with physical objects rather than digital ones (Petrelli & Whittaker, 2010; Tsai & van den Hoven, 2018a). This is due to the development of traces of time and usage, making objects unique and irreplaceable (Tsai & van den Hoven, 2018a), and to their visibility in the home, being available for interaction and contact (Petrelli & Whittaker, 2010). Therefore, the aim was creating physical memory cues, using hand-made techniques to create an even stronger bond between the person and the object, emphasizing its uniqueness.

I wanted to test whether this kind of emotional tie would further encourage the act of memory curation. This could be valuable insight in developing new digital tools, especially since they tend to focus on practical retrieving of media rather than on *reminiscence* (Broekhuijsen et al., 2017; Jansen et al., 2013; Sellen & Whittaker, 2010; Stevens et al., 2003). Furthermore, given my interest in the theorization of *ubiquitous computing* (Weiser & Brown, 1996), I wanted to explore how new forms of recollection could take place outside a screen (see Norman, 1998), more integrated with their context and the human behaviours that concern the act of remembering. I decided to produce a physical output and design not just as a way to represent memories, but also as a new method to interact with them.

While photographs and video recordings are realistic portrayals of past events, I decided to go against the tide of hyper realistic memory following the path of abstraction. My research indicated that even if studies have shown benefits of detailed digital memory recordings (Konrad et al., 2016), there are still issues that arise (Meyer, 2015) since it hinders our natural tendency to forget painful events (Walker et al., 2003). It also creates privacy problems in passing our legacy on to dear ones (Ziccardi, 2017). Furthermore, forming self-identity is one of the most important aspects of memory (Van Dijck, 2007) and abstraction is an important tool to foster *reflection* (Sellen & Whittaker, 2010), the type of recollection that focuses specifically on personal formation and growth. An example of abstract memory cues are souvenirs (Haldrup, 2017). However, while they aid recollection through metonymy (Morgan, 2005), I had to create a link to memories creating something new, that had no ties to the past. In order to do so, I decided to encode stories using a visual language. This would use a similar approach to Giorgia Lupi's *Bruises* (2018) and Hanna Waldron's works (n. d.), using a visual vocabulary to describe a narrative in an abstract and very personal way.

Since my project's output was physical, I decided to encode memories with shapes and forms, but also materials, adding the dimension of the sense of touch. I wanted to test if involving more types

of sensation was effective in creating a meaningful output, that would encourage further the act of curating memories. I was further motivated by the rise of consumption of instant cameras (McHugh, 2018), suggesting a longing for memory objects that could be held rather than just be seen.

Given the artistic nature of the project which was taking shape in my mind, I decided to limit the scope of it to a personal experience rather than trying to create a product that could be used by a multitude of people. The idea was to experiment on myself, analyse my reactions and feelings in the creation of personal hand-made memory cues, and leave for the future the possibility to open the experience to others. My findings will be valuable insights to proceed in creating larger scale projects, identifying solutions that worked in my case and could be tested on a wider audience.

I also limited my work to analogue media. Creating a mixed-media experience like in projects such as *Pearl* (Jansen et al., 2013) and *Living Memory Box* (Stevens et al., 2003) would have created much more complex dynamics to study. I wanted to proceed by degrees, start with a completely analogue support, test its benefits and effects on me, and avoid connecting it with digital archives. In addition to this, my goal was not materializing digital collections, but memories. My argument is that certain emotional events might not be represented at their best by photos or videos, but with a more abstract and empathy oriented visualization such as *Bruises* by Giorgia Lupi (2018).

3.2.2 Methodology

To realize *Amarcordi*, I had an initial brainstorming phase in which I decided what shape and form my memory object would take. It involved defining which stories to choose, how to represent them, how to encode them in a visualization format, what artisanal technique to use to materialize them, and finally what would be their physical support.

To design what shape to give to this object, I had to consider what interaction would foster *reflecting* and where it would be placed in my home. I was not just designing a bidimensional visualization, but a physical artefact that should find its place in my everyday life encouraging recollection.

This led me to trying out different technical solutions, and learning artisanal techniques I had never tried before. Through trial and error, I tested which materials and encoding worked best, and what were the visual aspects that I should focus on in my designs.

Once I had reached convincing prototypes, I had the possibility to test their effectiveness as memory cues in my everyday life. I had to analyse my reactions in order to develop my findings. In defining what kind of approach to follow, I considered quantitative research pointless from the beginning as my focus was on emotions and thoughts. Since I was the target, I had to dismiss all of the familiar user research qualitative methods. For example I could not carry out interviews, since I would be both the facilitator and the user.

Finally I discovered the approach of autoethnography (Haldrup, 2017; Hine, 2020; Morgan, 2005) and decided it would serve well my need to investigate in this personal and artistic context. This research methodology was originally applied by social scientists to study a specific cultural context as an insider, with a subjective, partial and situated perspective (Gannon, 2017). It shares ethnography's

desire to access everyday life and develop an understanding of broader social phenomena (Anderson, 2006), but accesses nuances that would be difficult to obtain over long stretches of time in someone else's home (Hine, 2020). It has been used both in the field of tourism studies to analyse personal affection and narratives associated with souvenirs (Haldrup, 2017; Morgan, 2005) and in the field of sociology to analyse the unspoken aspects of living in smart homes (Hine, 2020). Since *Amarcordi* is built around my person, autoethnography allowed me to access my personal experiences, focus on emotions and feelings, and give myself both the role of the researcher and of the object of study.

Another advantage of this methodology is the possibility to approach the study without structured expectations of the outcome and what will be significant (Hine, 2020). I can analyse and find meaning in my thoughts when reexamining my notes. It allows me to capture my experience engaging with *Amarcordi* spontaneously, having the freedom of noting down my impressions and thoughts not only in the moment they are happening, but also in retrospect (Hine, 2020). The possibility to separate the moment of experiencing from the analysis has proven to be especially helpful since I was trying to observe my reactions and behaviours involving these memory cues without thinking of them as "thesis work".

This approach demands an involvement not only of the researcher, but also of the reader, aiming for a communication of experiences rather than a neutral description of events as prescribed by traditional ethnography (Gannon, 2017). This has the advantage of giving me the possibility to express my feelings and emotions in a spontaneous style, transmitting my personal thoughts to the reader in a subjective and flexible manner.

Autoethnography has raised criticism since it rejected traditional social science values and styles of writing, causing its marginalization in the field (Anderson, 2006). In addition to this, removing the distance between researcher and object of study made it prone to accusations of self-indulgence (Hine, 2020), impacting the scientific credibility of the study because of its very singular personal perspective (Gannon, 2017). This was not an issue in the context of my artistic research and given the uniquely personal target of my project.

I also decided to follow Anderson's suggestion (2006) and follow a more "analytic autoethnography". He sees the value of this methodology in making the researcher part of the study and visible member in the published text, however he highlights, among other things, the disadvantage of requiring considerable narrative skills to produce a creative writing that differs so much from traditional academic standards. For this reason I do not include in this thesis autoethnographic fragments, but an analysis that is already an elaboration that evaluates the findings extracted from my notes, including them as quotations.

I collected notes of my reactions and thoughts regarding the prototypes for a period of a month. This started just after I created the first batch of memory embroideries, while I kept making other ones. In the scope of this thesis, I did not have the chance to study my reaction after distancing myself from the moment of ideation and creation of the project. It could be revealing and meaningful to conduct such research in the future.

3.3 Developing the project

3.3.1 Definition of the tools and techniques

How to record memories, if not through writing, photos or videos? Following existing examples (Lupi, 2018; Waldron, n. d.), I understood that my memory objects, in order to work as an aid to recollection, needed to record personal stories through a form of encoding. I could not just represent my memories figuratively since I wanted to achieve the abstraction that would foster *reflection* (Sellen & Whittaker, 2010). I carried out some additional research regarding the birth of writing and pictograms (Frutiger, 1989). This allowed me to understand that the signs and encoding of any visual language are strongly bound by the tools used to write, carve, paint or weave. It brought me the awareness that the first step had to be defining the technique I would use.

I decided to adopt embroidery, even if I had never practised this traditional craft before. I wanted a medium that allowed very warm outputs that could be touched and held to create a memory object that could convey physical sensations, not just visual. It allowed playing with several textures giving me the possibility to use different materials as a parameter of encoding. This also meant touch would be an important part of my work, adding more depth to the emotional connection with the final output (Tsai & van den Hoven, 2018a). Creating an object that was pleasant to hold was also key to encouraging interaction, creating more occasions to recollect and reflect (Petrelli & Whittaker, 2010), having immediate access to my memories, without the mediation of an interface (Krishna, 2015).

Personal experience has also taught me knitting, sewing, embroidery and similar crafts have remarkable wellbeing effects on me. Their manual routine is relaxing and pleasant. A specific advantage of embroidery is the possibility of working without the rigid constraints of a scheme. When weaving or knitting, you have to count stitches, be very mathematically precise. With embroidery, precision lies entirely on the personal vision and sense of touch, allowing a less mediated and more spontaneous experience. A further wellbeing effect is given by practicing an activity that brings me away from screens and digital devices, it is definitely a calm technology (Weiser & Brown, 1996). Creating a positive experience was important for my project since encouraging memory curation involved designing a new way of carrying out this activity that did not feel like work. As Stevens et al. (2003) argue, it is necessary to remove the "work" part of curating memory archives in order for people to practice the needed curation.

Another aspect of embroidery that encouraged me to choose it as a technique, was the possibility to work on small cloth surfaces. My aim was synthesis since I wanted to avoid producing large and bulky outputs: my object had to have the possibility of being held and find its place in my small apartment to encourage recollection (Petrelli & Whittaker, 2010). In addition to this, embroidery gave the possibility, with practice, to stitch with a good mixture of detail and variety. In this way, while informing the visual signs I defined, it did not pose too strong a limitation on the heterogeneity of memories. I wanted to encode my memories through symbols or pictograms, in order to have a visualization to find patterns, and see events from a different perspective. This is important to encourage reflection (Sellen & Whittaker, 2010). However, I also wanted each memory to be unique and very personal to develop strong emotional bonds (Tsai & van den Hoven, 2018a).

3.3.2 Design of the visual language

What are the necessary elements to create a story? The components to any narration include characters, setting, plot, conflict and resolution. In addition to this a story needs a theme, which is the idea, belief or insight behind it. I selected only some of these for the encoding of my memories. I decided to record them as a flattened portrayal of the event, not taking time and plot into account. This allows a higher level of abstraction and synthesis. My visualizations include characters and objects in a setting, highlighting the theme or insight which resonated with me. In addition to this, emotion and atmosphere were of great importance for me, and were included too.

Characters, objects, settings and themes require stitches to take a shape that connects to a specific meaning. Like pieces to a puzzle, visual elements provide me with very basic and abstract inputs that my memory can build upon to recollect. Some pictograms are meaningful on their own, (eg. the symbol representing me, my family, a specific friend). Some need to create a more complex message (eg. idea of growth). I have taken inspiration from archetypes and symbols that are part of my cultural memory, however I also created my own in order to address my needs.

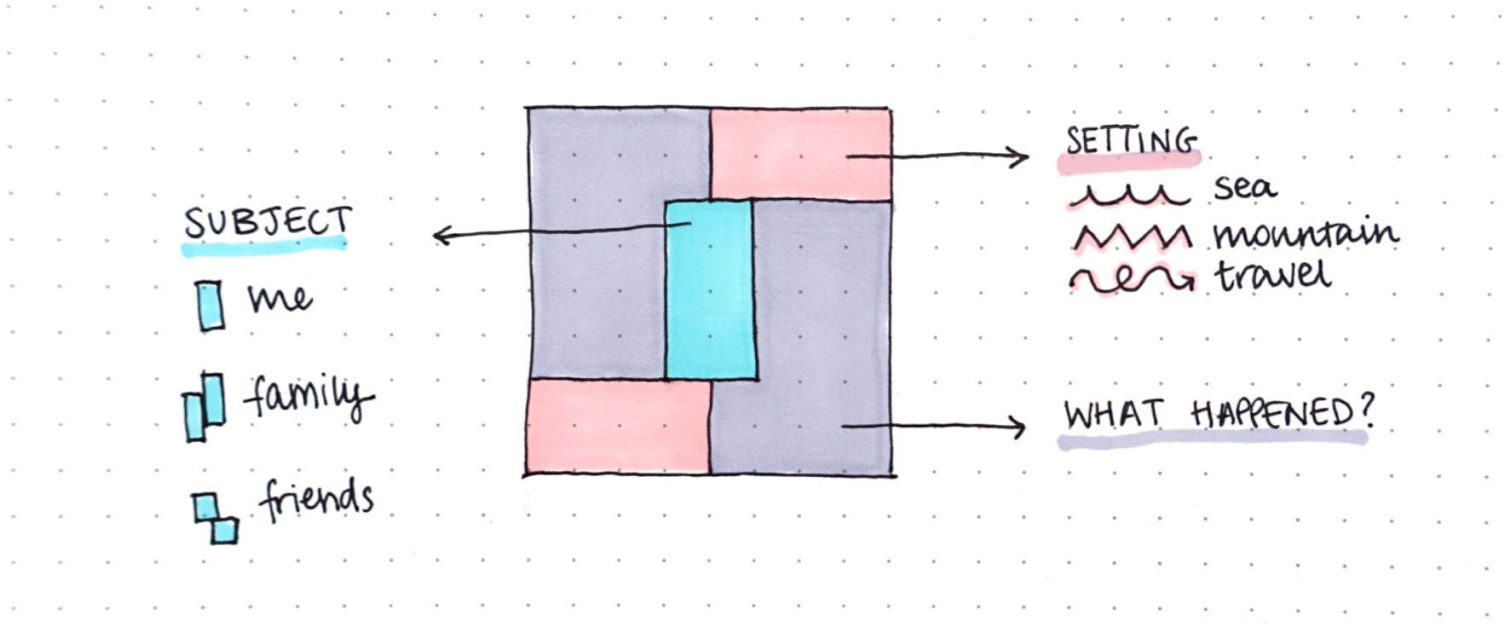

Figure 3.1: Structure of the information architecture of the *Amarcordi*, with examples of the possible content.

Using a grid and a common logic for positioning the elements of the memory (Figure 3.1), as well as having the same shape to represent certain people, locations and similar events, allows the viewer to find visual patterns and notice repetition. I want to follow Lupi's example (2016) and use data visualization to allow me to gain new perspective, to discover patterns I could not have noticed otherwise, and gain insight and self-knowledge.

I decided to indicate emotions with the choice of colour and texture. Positive feelings have brighter colours, smooth and soft textures. Negative ones are darker, bumpy and irregular to the touch. I also tested the use of different thread materials, cotton, wool, and metal, as well as different kinds of knots and beads. I associated the use of colours also to the atmosphere of a particular memory. Recollections of hot and warm moments use tints of red while cold and windy ones use blues. Figure 3.1 illustrates how I tried to define the colour palette with a matrix that combines emotions and atmosphere.

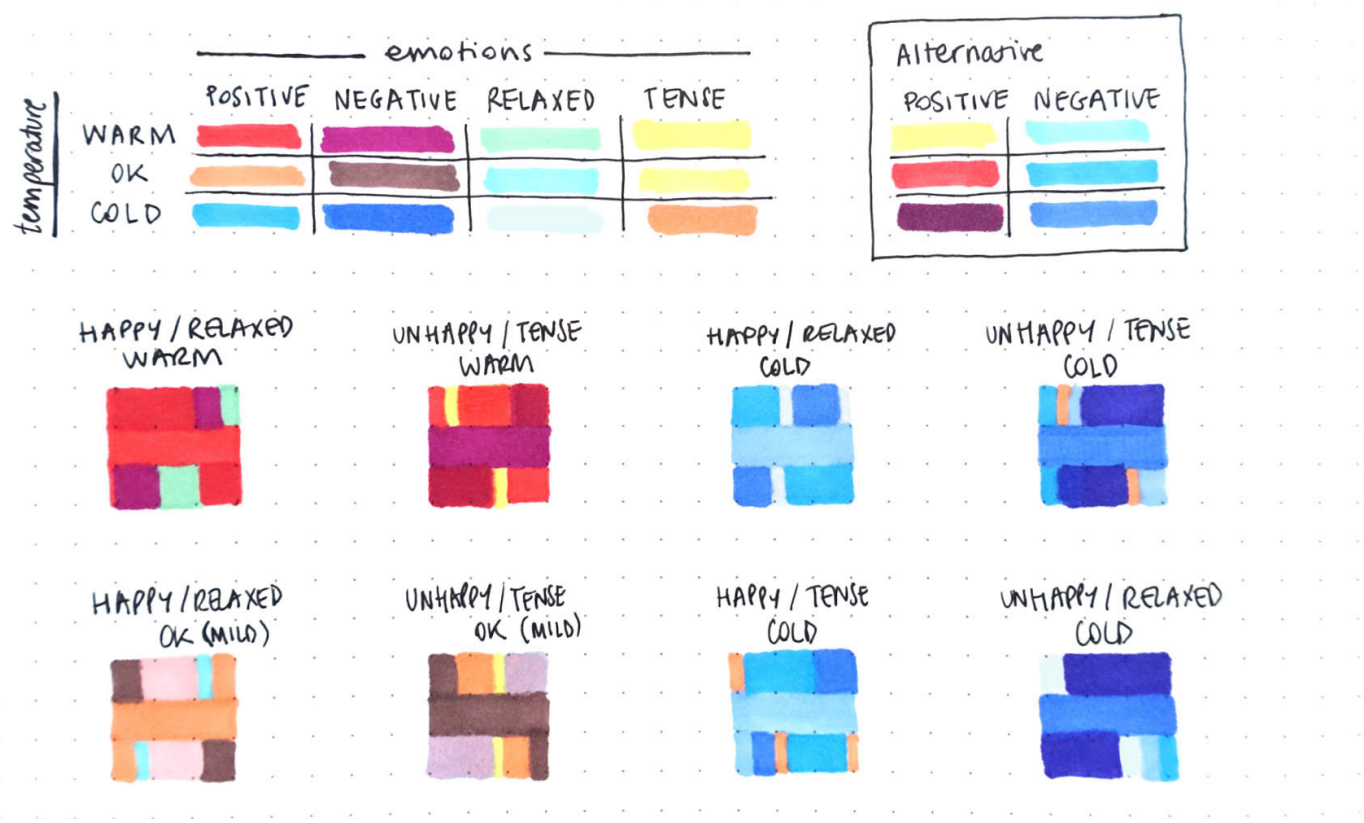

Figure 3.2: Color study. The main matrix is determined by a combination of temperature or atmosphere and emotions. The lower half illustrates examples of colour combinations of possible memories.

I decided to map the strongest visual feature, colour, and all touch related variables, material and texture, to emotions and atmosphere because they are those dimensions usually left out of the picture by digital tools that tend to focus on efficient retrieval (Broekhuijsen et al., 2017; Jansen et al., 2013; Sellen & Whittaker, 2010; Stevens et al., 2003). I wanted to design a visual language that encouraged reflection on past experiences (Sellen & Whittaker, 2010) and finding patterns through innovative points of view. It is important to highlight emotions also to create a stronger bond with these memory objects (Tsai & van den Hoven, 2018a) encouraging me to take care of them and create more.

3.3.3 Design of the support

The reverse side of a piece of embroidery cannot be seen or touched. It consists of an unappealing tangle of threads, which should be guarded from being pulled or broken. Hence designing some kind of frame or container for my stitched memories was not up for discussion. I took this as an opportunity to further design the experience of recording and reliving my memories.

Firstly, the display system I was going to design had to allow me to add new memories in time. This means I had to plan how it should incrementally grow as new items are added and what rules would be applied in ordering them one next to the other. Rather than imagining a support that would allow a simple chronological order by creation data, I wanted the flexibility to be able to re-order *Amarcordi*, arranging them in new different ways. A modular system which would allow me to choose different organization logics changing the overall appearance.

Modularity has the additional benefit of allowing me to eventually eliminate memory cues I do not want to see anymore, or possibly modify existing ones. This allows for the medium to reflect the human desire for re-elaborating recollections continuously, in order for them to match with the ever changing perception of self (Konrad et al., 2016; van Dijck, 2007). Giving the possibility to change a previously created embroidery proved to be technically harder than I thought, and I had to renounce this feature in my final outcome.

Secondly, I wanted to design an object that encouraged picking it up, holding it and feeling the texture of the embroideries. The end result had to avoid generating the impression of a painting or a tapestry, whose purpose is to hang on a wall, untouched. My goal was to create a support that could live in my home, among my other possessions, and encourage me to interact with it and feel it with more senses than just sight. My memory cues should not be hidden in a drawer, just like their digital counterparts are hidden by layers of interface in my devices (Krishna, 2015). They should be visible in my home, available to be held and touched fostering recollection (Petrelli & Whittaker, 2010). The possibility to interact with them would leave traces in time, increasing their emotional value (Tsai & van den Hoven, 2018a). To achieve this, it had to be small enough to hold comfortably, not too heavy, and placed in the overall composition with a system that allowed to easily place and then remove each piece, without following a strict order.

I decided to place my embroideries on square blocks of wood, which can be placed one next to the other to form a larger picture, or be picked up and seen individually. Their size is relatively small, 6x6cm, making them comfortable to hold in my hand as well as aiming at keeping each memory quite reduced in size. I didn't want to build a huge piece, it had to fit in my flat, where there are relatively small available spaces and surfaces.

Designing how to bind the fabric to the support was challenging. The use of glue for instance, revealed itself to be problematic in some early prototypes (Figure 3.3), since it seeped through the threads, soaked them and, once dry, ruined their material turning soft surfaces into hard ones. It also taught me that the wood should not be too prominent as a visual feature: the embroidery has to be the focus. In addition to this, I did not want to use frames, which would distance memories preventing the formation of a composite bigger picture. In the end I decided to fold the cloth around the wooden

block, covering the wood beneath it, and using these additional parts of fabric to attach it to the support, avoiding using glue behind the embroidery.

These blocks had to be easy to assemble together, take apart, re-organize and move around. I wanted to experiment freely and give myself the possibility to discover which were the moments and places I liked to use for recollection. I wanted a flexible design to avoid taking all the decisions *a priori*, and leaving open the possibility of gaining new insight through testing. I initially started thinking of frameworks to hang the blocks on the wall with grid supports that would allow placing, snapping or tying the wooden squares. However, this would create several limitations to the addition of new memories as well as to the possibility to move them to different locations.

Figure 3.3: First prototype of *Amarcordi*.

In the end, I chose to add magnets to the four sides of my *Amarcordi* (Figure 3.4, 3.5). This allows for a playful interaction which reminds one of a puzzle. Wooden blocks snap together with no effort, and can be easily re-organized, added and removed. I decided to begin my testing by simply placing the resulting block sculpture on an available surface in my room, and decide later if additional support for hanging the blocks was needed.

Figure 3.4–3.5: making of the support for *Amarcordi*, involving preparing the wooden blocks and adding the magnets.

3.4 Documenting “Amarcordi”

3.4.1 The process of creating an “Amarcordi”

In order to create an *Amarcordi*, the first step is deciding what to record. There were so many memories worth saving I was having difficulties deciding the selection criteria to apply. I did not want to create too many rigid parameters, and simply allowed myself to roam with my mind, searching for those recollections that I felt were the strongest in forming my identity, those stories I end up telling time and again to friends and acquaintances. In other words, *Amarcordi* are a tool to collect pieces of my past, selecting the stories that have made me develop my personality, or that remind me who I want to be, where I want to go, and what I should do. Curating these blocks, should be like curating the images on my Instagram feed, but for my own personal benefit only. The same attention I place in constructing an image for the outside world on social media, I want to dedicate to shaping a much more truthful and sincere one for myself.

Once I have selected a memory, I start visualizing it and encoding it into the grid I have previously defined (Figure 3.1). I draw the shapes and pictograms that can best summarize the story I chose, and carefully balance realism and abstraction. If the shapes are too far from a recognisable form, and are too geometrical and ambiguous, I risk forgetting what I meant to encode. Figure 3.6 shows an example of a preparatory sketch.

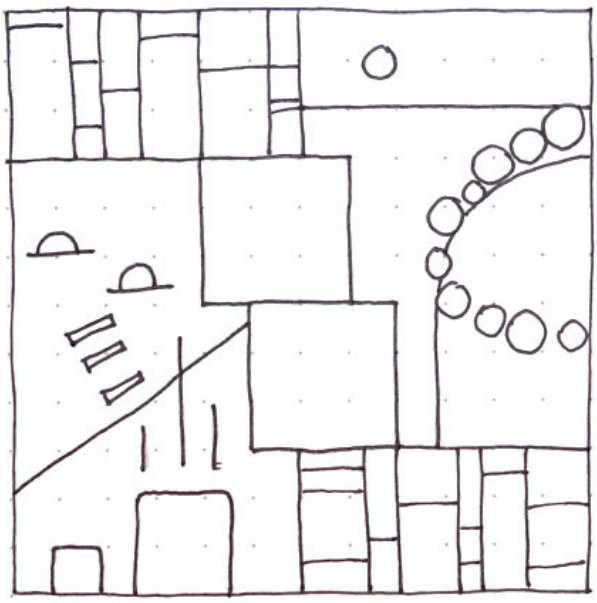

Figure 3.6: Sketch for an *Amarcordi*.

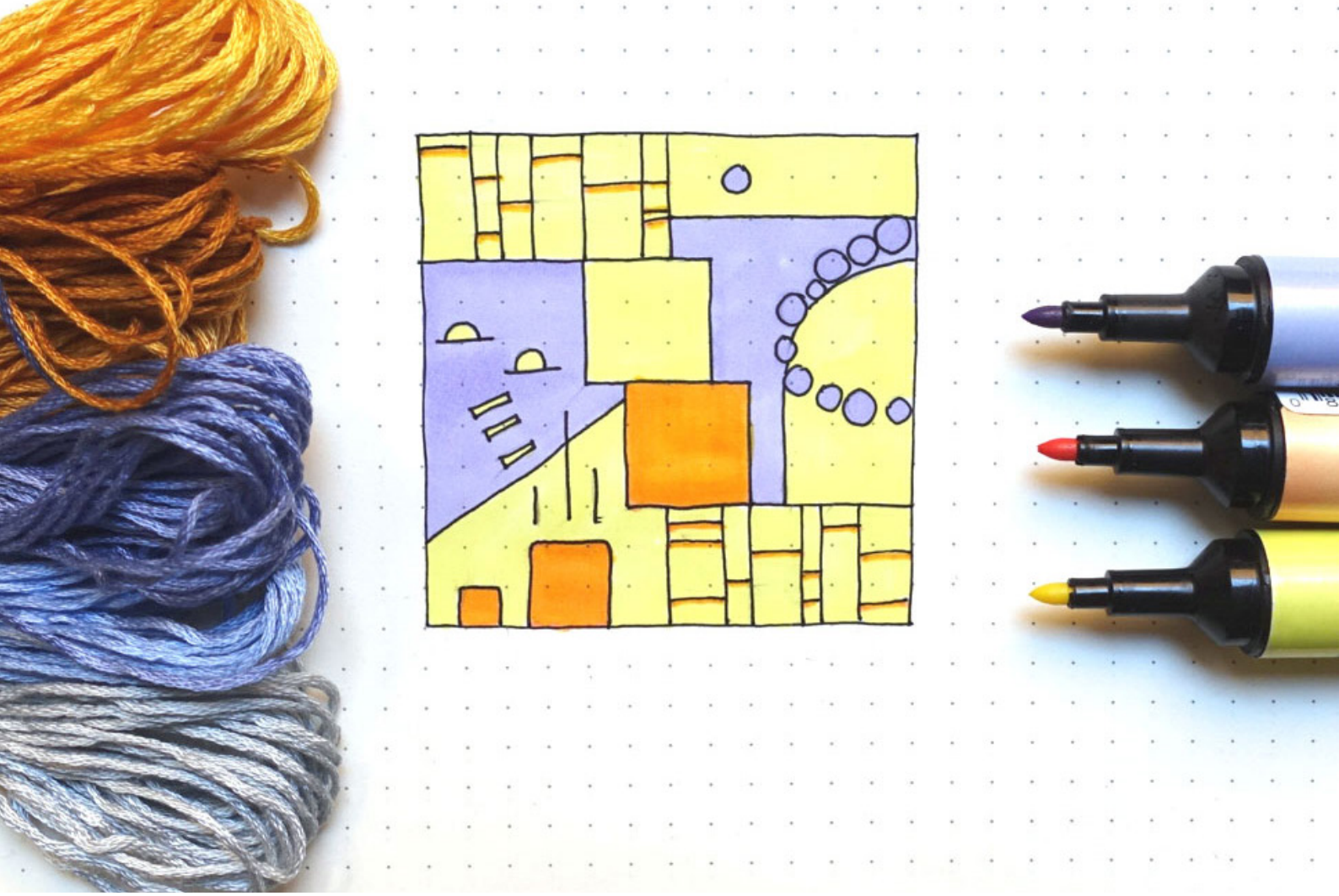

Figure 3.7: Sketch with colour planning.

When the rough drawing is ready, I start defining which emotions and atmosphere are involved with that memory. Following the colour scheme I defined (Figure 3.2) I decide if I am going to use a cold, warm or mild palette. Next, I decide the percentage of positive and negative emotions to choose the brightness of the dominant colour. Accents will be determined instead by the presence of a relaxed or tense mood. I take into account most memories have mixed feelings associated with them, and give my embroideries the chance to reflect the compresence of contrasting emotions.

I add the colours to the sketch trying to imagine what threads correspond to the felt-tips I am using. In Figure 3.7 is a demonstration of the end result of my colour study. This plan is never considered as an obligation, it is merely a guideline. When I start working with thread I often make slight changes since the technique and the material influences the outcome deeply.

The next step is setting up the frame and the cloth. This setup is fundamental to stretch the fabric in tension, and give the support needed to work with thread and needle. To follow the design, I do not draw guidelines on the textile itself since it might leave traces on the final result. Instead I use thread as a guideline to limit the space of my work (Figure 3.8). Once my work is finished, I can simply remove it without leaving any trace. It is very important right from the setup to follow with exact precision the weft threads, otherwise the final result would result in being skewed and crooked.

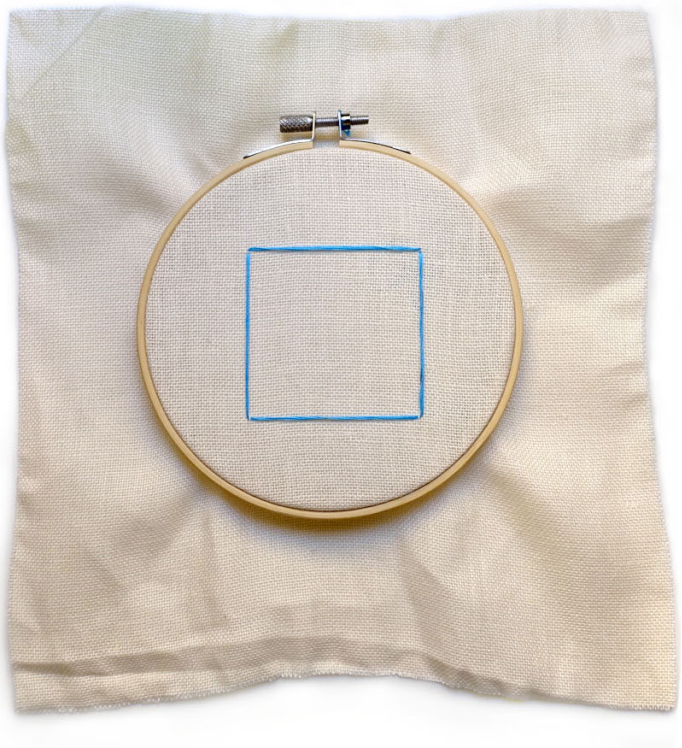

Figure 3.8: Frame with linen cloth and guidelines for embroidery.

While I start embroidering, the technique and the material of the thread I use are of great importance to indicate the feelings I want to encode. In Figure 3.9 I show the knots I often apply, going from the most positive, associated to thick wool, to the most negative, which consists in tight knots that create a bumpy surface. To give more rhythm to the composition, I also use felt-tips to colour background sections of the piece, on top of which I stitch smaller details.

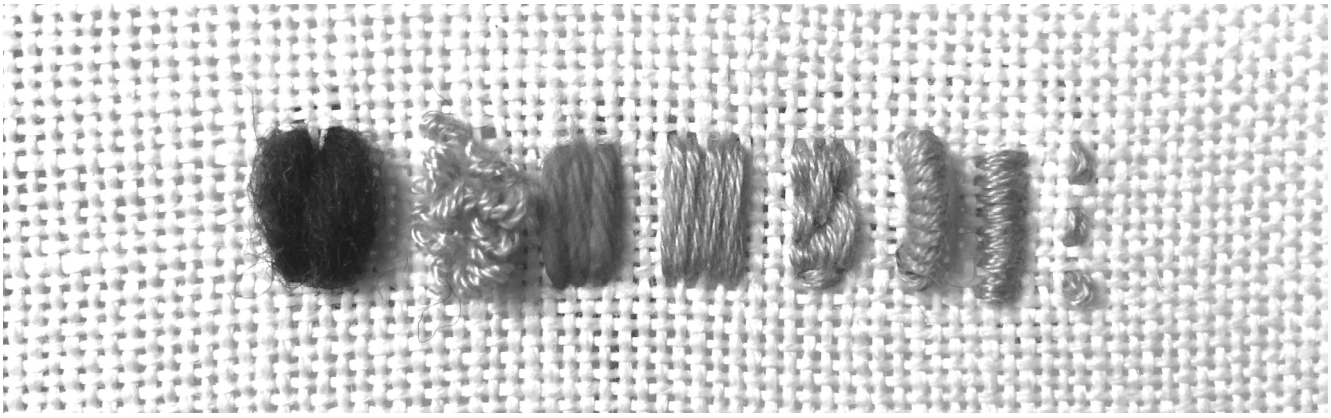

Figure 3.9: Different kinds of thread material and knot types. From left to right going from the most positive feelings to the least positive ones. The photo is desaturated to avoid any bias given by colour.

When I start embroidering, I usually begin from the central shapes which represent the subjects of my story (Figure 3.9, 3.10). This allows me to immediately fix the centre of the compositions. As I explained previously, I do not draw a precise grid on the cloth; I want to keep the experience of creating the *Amarcordi* as less mediated as possible. Embroidering takes time, it is quite a repetitive action, and has a slow pace that gives me all the space to associate my recollections and thoughts to those pieces of thread, using both sight and touch. A great advantage of this technique is you can always go back if a mistake is made, pulling out that piece of thread and starting again.

Producing an *Amarcordi* is relaxing and absorbing, and it does not take more than an afternoon, even at my beginner level. In reality, the most time-consuming activity is probably planning the piece, before and during its creation. As I found solutions for different combinations of emotions and textures, I gained the experience to work much faster on the subsequent designs. This implies that having a well established visual language removes the need for excessive planning of the visual outcome, leaving more space for the encoding of the memories and a smooth embroidery. Once the composition is complete, I pull out the guideline thread and am left with the end result (Figure 3.11).

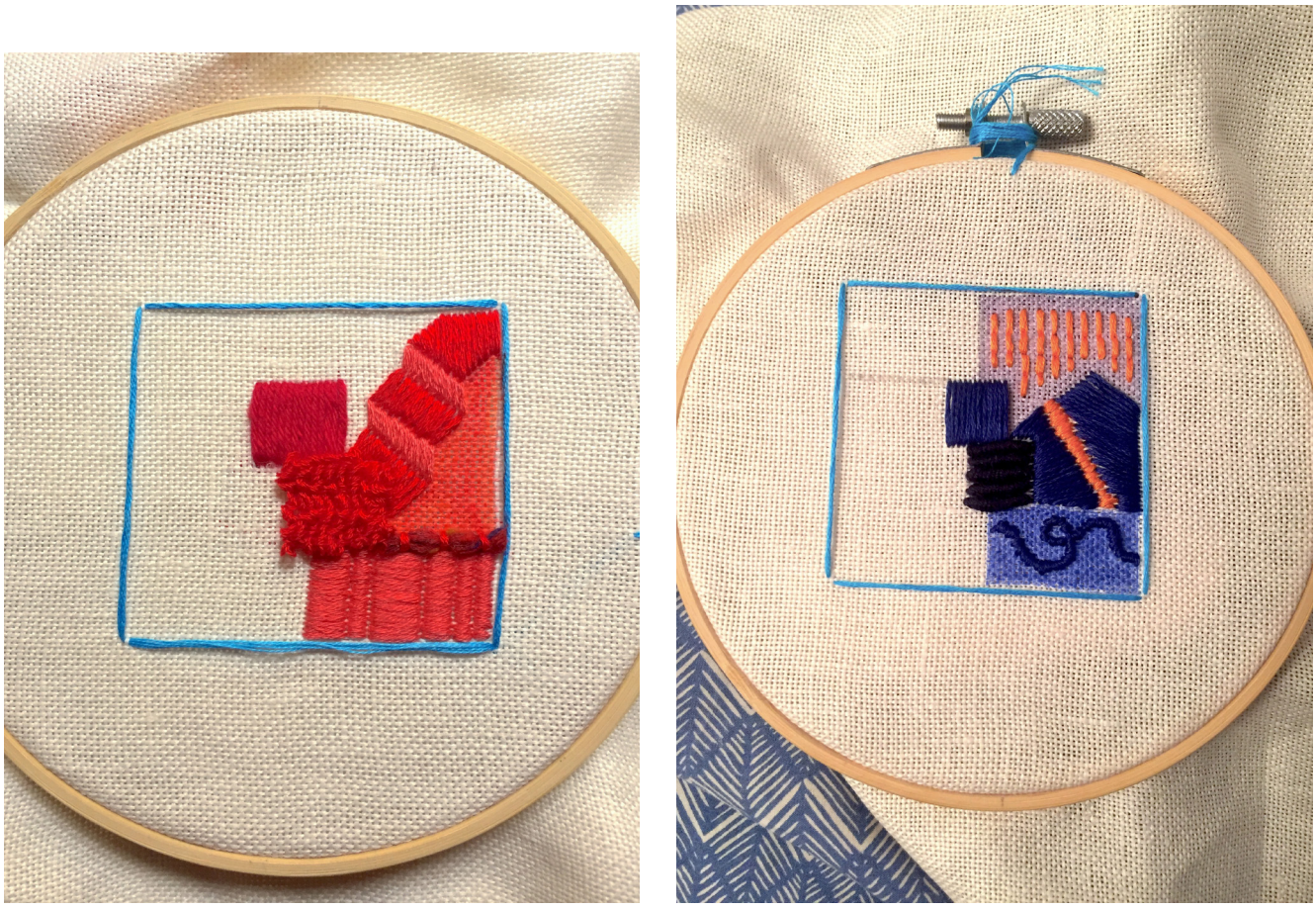

Figure 3.9–3.10: Two embroideries halfway through their creation.

Figure 3.11: A completed embroidery.

To conclude, I remove the embroidered cloth from the frame and prepare it for its support. This steps involves cutting the fabric to the correct size (Figure 3.12), and attaching it to a wooden block equipped with magnets on all of its four sides. The *Amarcordi* is now complete and can find its place among the others (Figure 3.13). Figure 3.14 shows different possibile locations where I tested placing them.

Figure 3.12: the embroidery has been cut with the precise shape required to attach it to the support.

Figure 3.13: a group of *Amarcordi* showing how they can be attached together thanks to the magnets.

Figure 3.14: Amarcordi placed in the house in different locations.

3.4.2 The final array of memories

The first memory I embroidered (Figure 3.15) was a happy memory, with some tense and scary moments. The colors are a palette of blue because it was very cold. Tension is given by the orange accents with tight knots that bulge from the surface. Most of the piece, however, has bright colours and soft materials and surfaces since the dominant emotions were positive ones.

Figure 3.15: ***Winter waves*****,** ***Amarcordi*****.**

Figure 3.16 represents a scary event where at some points I believed I was risking my life. The colours are dark, the temperature is cold, and orange accents represent the angst and tension I felt. The surface of the embroidery is bumpy with several knots and the thread is rough to the touch.

Figure 3.16: ***Thunderstorm*****,** ***Amarcordi*****.**

Figure 3.17 is split between two color palettes. It represents the two sides of the same story: the coldest day of my stay in Finland, the lowest temperature I ever experienced, and the warm sauna I enjoyed with a friend on that occasion. The colours are bright, it is a very positive and joyful memory. It has green accents to indicate how relaxed I felt in the sauna, and orange ones on the cold side of the design, to indicate my excitement. The material is soft and smooth.

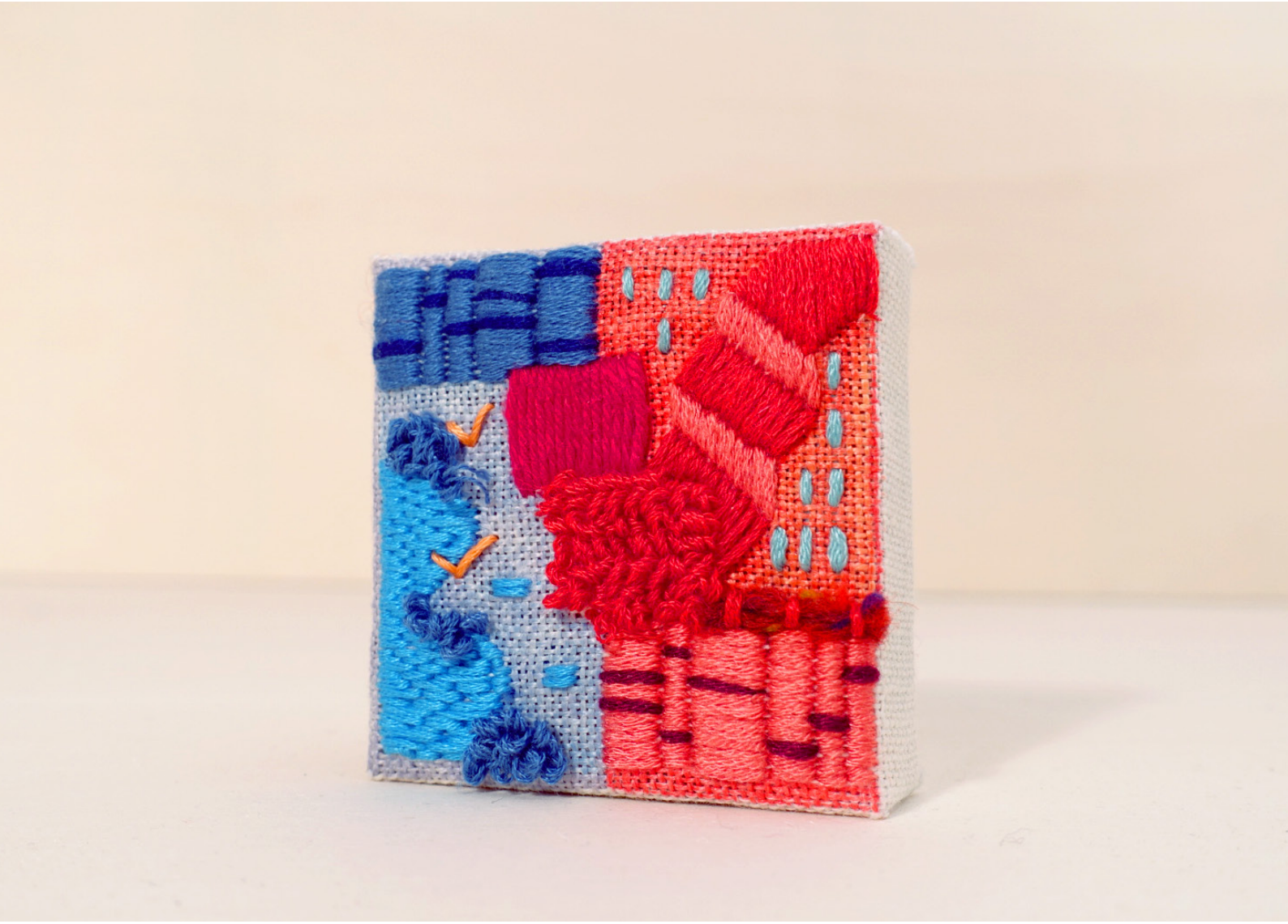

Figure 3.17: ***Freezing warmth*****,** ***Amarcordi*****.**

Figure 3.18 has a yellow based colour palette because the atmosphere was neither hot nor cold. The subjects are friends and the memory is set in Finland (the corner embroideries and the central symbols are the same as Figure 3.17). The colours are mainly bright and the materials are soft to indicate positive emotions. The light blue elements indicate calmness and relaxation.

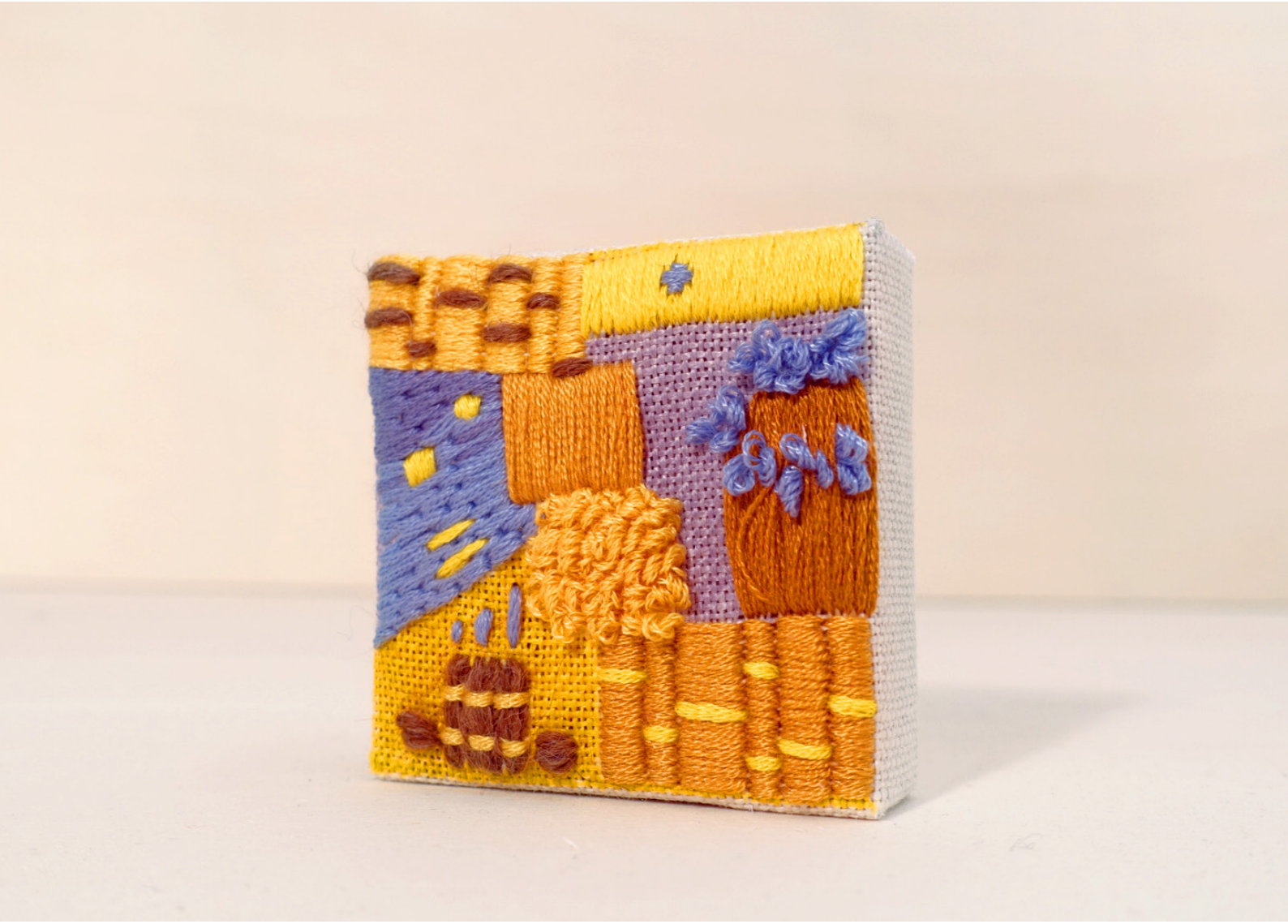

Figure 3.18: ***Midsummer*****,** ***Amarcordi*****.**

Figure 3.19 looks similar to Figure 3.18. The mixture of positive emotions and relaxation, the mild temperature, give it identical feelings, but the stories are completely different. The setting is my home and the main characters are family members. It is the recording of a childhood game.

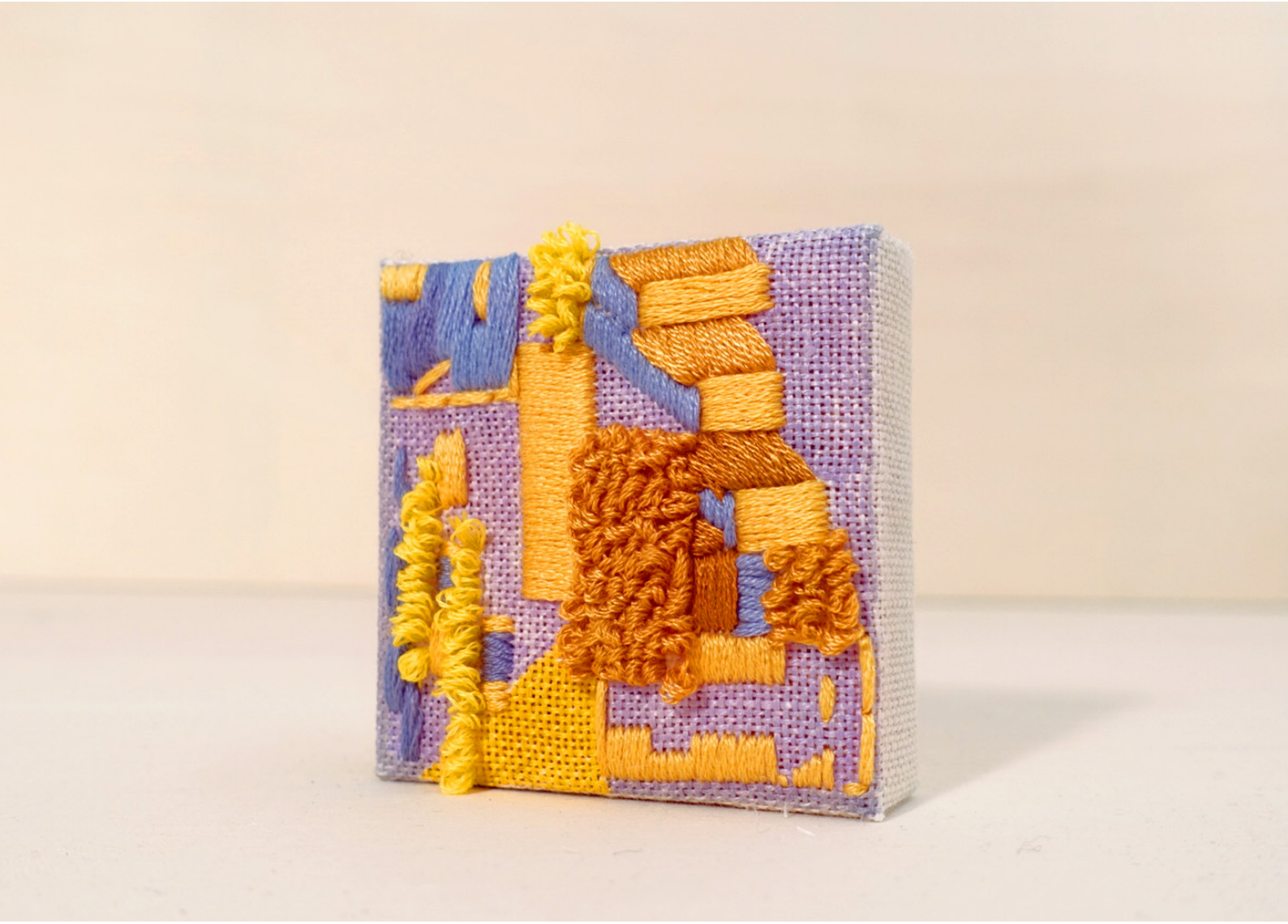

Figure 3.19: ***Ziggurat*****,** ***Amarcordi*****.**

The last *Amarcordi* (Figure 3.20), is a warm memory with a mixture of positive and negative feelings. Both the colours and the material present soft and hard parts, bright and dark ones. It is a recollection from a trip, as indicated by the symbol in the bottom right corner.

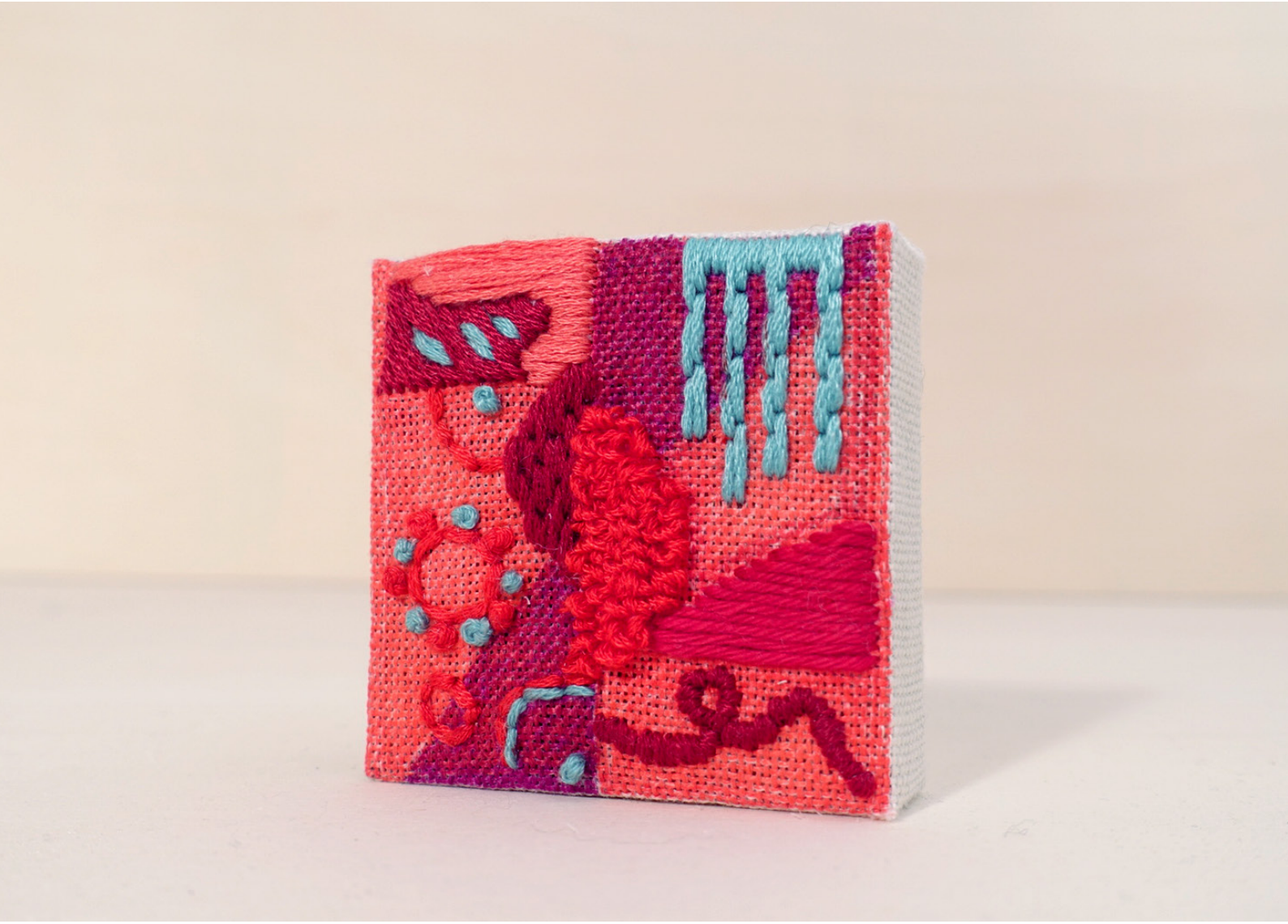

Figure 3.20: *Blue rings*, *Amarcordi*.

4 Findings

4.1 Autoethnographic analysis

To conclude my work, I aimed at studying my reactions and thoughts around the final output of my project. I followed the example of previous research (Gannon, 2017; Haldrup, 2017; Hine, 2020; Morgan, 2005) and used the methodology of autoethnography to research my reactions, thoughts and emotions while interacting with *Amarcordi*, using then a more analytic approach (Anderson, 2006) to present my analysis in the context of this thesis.

I collected notes for a period of a month. This started just after I created the first batch of memory embroideries, while I kept making other ones. In what follows I present the deductions and considerations which originated from my notes, divided in different thematic sections. I include quotations from the original text of my notes, which were sometimes written while looking at *Amarcordi*, sometimes recorded at a later time, for example when they regarded conversations with friends or family.

4.1.1 Overview

I analysed my thoughts looking at *Amarcordi* from a distance, standing on the opposite side of the room, 4 meters apart from them. My notes indicated how I can clearly perceive an overview effect thanks to the distinct colours. It seems like they allow me to create a visual pattern and have "a strong perception of which are the most predominant" ones. The use of strong, bright primary colours makes certain parts of the embroidery "clearly stand out even from a distance", indicating a possibility to further design the visibility of certain memories working further on the balance between analogue and complementary colours.

I was reassured that I could always recall the precise elements of the story I decided to encode in my embroideries, even from afar: "if I focus my attention on the shapes, I can actually distinguish them enough to create an immediate connection with the associated memories". I also confirmed that the shapes and pictograms I used allow me to recognise recurring places, people and emotions. I can see "I only saved happy memories from when I lived in Finland, and ignored the negative ones" for example, and that memories from holidays "might refer to uhappy or scary moments, but I still chose to record them".

It seems the creation of recognisable visual patterns has generated in me the desire to look at events with a self-reflective attitude. "I wonder what that means", I wrote, indicating the presence of new information I had yet to understand. These are exactly the kind of thoughts I wanted to instill through *Amarcordi* to encourage self-understanding and identity formation. Another example is my

surprise in seeing most of my recorded memories involved friends rather than family members and partners: “this is interesting, and opposite to what I thought would happen”.

When I step closer to the *Amarcordi*, I get more detail and consider that “each of their section triggers different recollections”. The pictograms and symbols work as keys to access memories of landscapes, events and people and “I can decide if I want to hover on the surface or dig deep into the details of that recollection”.

4.1.2 Positive memory

When holding in my hands a positive memory I can tell “this one is a good memory, I can immediately feel it as I pass my thumb over the warm, smooth material”. Adding the dimension of touch through the use of precise textures to represent positive and negative emotions resulted in being very effective. “The material gives such a strong haptic feedback”, I write after having closed my eyes while holding the *Amarcordi*, “I am now much less driven to thinking of the narration behind the visualised memory, and much more inclined to concentrate only on what I am feeling on my skin”. This brings me to focus on “sensing the emotions I chose to represent”. Another advantage is creating a pleasant way to recollect since while stroking the fabric “I feel like I could keep doing it for a while, it is one of those relaxing and repetitive soothing actions”.

I recall that the memory represents the coldest day I experienced while living in Helsinki. It was -26°C and I went for a walk with a friend. “It was freezing and exciting”, as the colour palette I chose to represent it indicates. However, half of the *Amarcordi* also has a completely different colour combination, referring to the part of the memory when we had a sauna in my student apartment to get some warmth and recover from the walk. The composition allows me to represent and recall a very diverse set of atmospheres and emotions, and “connect the characters, places and events as my finger passes over the different shapes that represent them”. In this way sight informs touch, which informs the recollection, enriching it with multi-sensorial information.

4.1.3 Negative memory

It was interesting to analyse my reactions looking at a negative memory. I wanted to understand if it would have a positive effect allowing me to distance myself from the negative feelings (Jose et al., 2012). As I hold the *Amarcordi*, “my fingers immediately start lingering on the rough and irregular parts of its surface” and “I can feel the strong contrast with the positive” memory. This tactile information conveys the negative emotions I felt at the time and made me “ remember the fear, the cold, the most difficult moments of that event”. This is such a strong memory, that “while holding the *Amarcordi*, I can almost feel excitement and tension building up in me even now”.

My notes show that even if the memory involves negative past emotions it causes positive sensations in the present: “I feel the adrenaline of those moments again, and relive the positive side of

things, leaving out the most scary and traumatic parts". I especially care about this specific recollection, because it reminds me of a dear friend, and how difficulties and hardship made our relationship grow stronger. It is significant that the *Amarcordi*, thanks to its abstraction, reminds me of the positive side of that story, without drawing unwanted attention to painful details. It is a story that has shaped me as a person and that I often tell to friends, but during conversation it is less intimate and I rarely take time to relive it in its full details on my own. Recalling it while holding the *Amarcordi* has made me reflect and realise "I am surprised by how negative this memory is, but how important it is at the same time".

4.1.4 Sharing

I had not expected my project would address the positive effects of sharing a memory, bonding with others (van Dijck, 2007). I realised *Amarcordi* could actually become the a moment to relive memories emotionally, encouraged by the social moment of sharing, as described by Sellen and Whittaker (2010). I noted down my feelings and thoughts after a friend's visit. I explained to him my thesis project and handed him an *Amarcordi* to hold in his hands. While I told the story behind the encoding, some of the details I pointed out "opened up new stories, based on the location of the memory especially". This indicated the possibility to highlight patterns in my past not only for my self-discovery, but also to give prompts that can encourage conversation and shared storytelling.

I was surprised by how "seeing him holding that memory felt very intimate", suggesting "having acquaintances handle such a precious thing would almost feel uncomfortable". This might be an indication of how I easily bonded and created an emotional connection with these objects. I also deduce they will be an interesting new way of bonding with family and close ones, but would probably not give the same benefit if shared with acquaintances.

Once I realised this unforeseen potential of my project, I also wanted to understand if it could become a means to give a piece of my past as a gift to someone, to leave behind me my life experiences. I tested this assumption with conversation with my mother, trying to discover if she would be able to recall the memories encoded in *Amarcordi* after days had passed since I had told her the story behind them. She said she would remember "the dark blue one, the one of that negative experience" and that it was the only one she could recall.

This indicated she is more likely to remember stories that are also relevant in her own personal past rather than events she had never heard of before. The fact that the first words she spoke refer to an *Amarcordi* are "the dark blue one" and "the one of that negative experience" indicate how successful the encoding is in associating colours to emotions, even for someone who did not experience them in first person.

4.1.5 Changing point of view

I designed *Amarcordi* and the possibility to rearrange them to foster reflection (Sellen & Whittaker, 2010). I wanted to understand if this feature allowed me to gain new points of view looking at my past. I noted that engaging with this activity "feels almost like a game". Even if my collection is still small, I can appreciate how the act of arranging them thanks to their magnetic sides makes me "feel very entertained" and allows me to organise them by colours, atmospheres, location, time of the event and order of recording.

Even if they are still too few to truly see patterns emerge, I can understand that "shifting them and grouping them makes the amount of positive memories stand out", but also "underlines the fact there are negative memories I felt like recording". Another interesting insight was realising "this is in such strong contrast with what I usually share on social media", while on the other hand "it does reflect my habit of telling these particular stories to friends".

I tried moving the *Amarcordi* around in my room and decided my desk is where I enjoy them the most since "I can see them and have them at an arm's reach". In addition to this, I consider it to be a spacious surface, where the *Amarcordi* can stand out and avoid being squeezed between other objects. I also noted that I will probably need more space in the future to store a bigger amount of memories, but even if challenging in defining new ways of displaying the *Amarcordi*, "I am intrigued" by the possibility to play with more or them since "more data will mean more interesting patterns and combinations to discover".

4.2 Reflections and considerations

My notes contained valuable insight to address my research question. The main goal was discovering new ways of encouraging memory curation and several aspects in this project have fostered my desire to keep building my collection of *Amarcordi*. The final result appeals to me on a visual level as well as a tactile one and creates new engaging ways of interacting with these memories. It gives me a strong motivation to keep working on new embroideries: it is a precise goal to aim for (Broekhuijsen et al., 2017; Jansen et al., 2013; Stevens et al., 2003). This technique that involves working with thread and needle was chosen with the specific purpose of distancing myself from screens and digital devices, and I confirmed my assumption that working on such a manual and analogue craft was relaxing and pleasant.

This wellbeing effect was also given by the possibility to focus on experiences without feeling I had to use a device to record them: now I have a new way to relive them. Even if I have access to technology that allows me to record almost every moment of my life (Sellen & Whittaker, 2010), I personally prefer focusing on living it and deciding later what is worth remembering. I do not enjoy the constant intermediation of a device while enjoying life experiences and I find liberating the fact *Amarcordi* allows me to record moments I did not take pictures or videos of. I do not believe lifelogging and products like *Google Clips* are the solution as its failures have demonstrated (Peters, 2019). We need to

understand where technology can help, and when it is best to leave more space for life, as *calm technology* theorists have been arguing since the 90s (Weiser & Brown, 1996).

Holding the materialized memory in my hand, feeling the different textures under my fingers, proved to be a powerful experience. The multi-sensorial object enhances significantly the process of recollecting, especially since it is tied to the emotions I felt. The only archival form I ever used that allowed me to save feelings and sensations was a diary, in my teenage years. I tried writing down some of my memories in the past year, and I discovered that looking back, reading the words I chose, caused me almost a feeling of embarrassment. I am not sure why, but the detail of a diary-like entry makes me feel uncomfortable. The kind of encoding *Amarcordi* have instead, is abstract enough to allow me to almost feel those emotions again, without the detailed mediations of words. I do not have to read; I feel happy, I touch the warm wool beneath my fingers and that pleasant sensation is a much stronger and less artificial reminder of the positive emotions I felt in that memory. Why are emotions so important? They are always bound to my digital collections, but are always left implied. Seeing them and feeling them through *Amarcordi* allows me to reflect much more easily on why that recollection is important for me and how it has shaped me. It gives me an innovative point of view to *reflect* on my past (Sellen & Whittaker, 2010).

I also found valuable the fact that a small piece of cloth could contain so many different memory cues. Each small symbol was able to unlock whole scenarios and reflections. One of my concerns while designing, was that there would be too much abstraction to properly remember a specific memory. This resulted not to be the case. The long process of stitching and a good balance between abstraction and the use of pictograms, allowed me to fix quite effectively recollections to the embroidery. To further confirm this, I noticed that when I looked at sketches which were left on paper without becoming finished *Amarcordi*, I often could not recall the meaning behind the shapes I had drawn. This means the slow act of embroidering is essential to retain the connection between memory and artistic artefact. This confirmed my assumption that aiding the process of encoding my recollections with the use of generative digital tools, for the design, or digital knitting machines, for the output, could have broken this tie. Working with abstraction, to foster reflection (Sellen & Whittaker, 2010), while still being able to recall the exact story behind the embroidery, relies on having the smallest possible cognitive load to read the design.

The overview effect was still left partially to imagination, since in the given time frame I was not able to produce a large number of *Amarcordi*. However, I could already appreciate its benefits in discovering recurring locations, emotions and atmospheres. I started immediately to wonder about certain patterns which I identified and this inspired several interesting reflections. I foresee the more memories I embroider, the more interesting insight will start to appear. The possibility to move blocks around in different orders helps this substantially, allowing to create groupings and visually isolating similarities and differences.

An unexpected finding was the pleasant bonding experience that I felt when sharing stories of a memory with a friend. I had designed these recordings to be for very intimate and private recollections, but they proved to work also for sharing it with close ones. It also gave me the opportunity to tell the experience while deciding freely what to say and what to filter out. It creates interesting opportunities

to pass on one's legacy. However my analysis highlighted it might only be limited to sharing experiences that involved the recipient for him/her to be able to decode the embroidery independently.

There were also some aspects which I believe should be further improved. I feel like the long amount of time which is necessary to complete one block is in part a drawback. I will probably become faster as I gain experience in this craft, and once the visual language is set and no longer a matter of internal debate I will be quicker in encoding the stories, but I still feel it might hinder the drive to keep producing these embroideries. Finding new solutions that share the same positive aspects while being quicker to make could be valuable. An aspect which can also be further developed in this regard, is the design of the support. It was not easy to find the right solution that could allow the interaction I was aiming for, and I believe more progress can be made in making the transition from embroidering to producing the final piece smoother and easier. While a slow pace in stitching and encoding has the side benefit of fixing more deeply meaning in the final output, the act of attaching it to the final support does not create such additional benefits.

Overall, I am satisfied with the end result and feel like I have devised a process and technique that can encourage me to keep recording my personal memories. The self-analysis I did highlighted the several benefits this practice can bring in my life and helped me to see a possible future habit that avoids depending entirely on digital companies to safekeep my most cherished possessions. It is not aiming at replacing digital archives, but separating different moments of remembering.

5 Conclusion

5.1 Final thoughts

My research has led me to become strongly aware of the great opportunities and resources digital media grant us with to manage our memory archives, and of the many controversial problems they raise. There is no doubt companies are addressing the new problems with business in mind, and this does not always correspond to people's wellbeing. I personally feel that my huge unsorted archives are a problem, similarly to the participants of past studies (Axtell & Munteanu, 2017; Broekhuijsen et al., 2017; Sellen & Whittaker, 2010; Stevens et al., 2003). I use more and more the power of algorithmic search implemented by Apple and Google Photos, and appreciate how efficient these features have become in aiding *retrieval* (Sellen & Whittaker, 2010). I strongly feel the need and responsibility as a designer to avoid that other sides of memory retention are left in the hands of corporations (Prey & Smit, 2018), offering people alternatives to look back at their past gaining insight and self-knowledge.

The theoretical part of the thesis analysed the importance of recollection for forming an individual's personality, encouraging self-reflection (Van Dijck, 2017). The lack of digital tools to encourage this activity is evident (Broekhuijsen et al., 2017; Jansen et al., 2013; Sellen & Whittaker, 2010; Stevens et al., 2003), and brought me to research innovative ways of fostering memory collection and storytelling. The personal project I designed, *Amarcordi*, allowed me to experiment in first person a new way of storing my personal stories, bypassing completely the digital, focusing on what really mattered: the experiences I lived. While some technical aspects can still be improved, the general outcome has proved to be effective in motivating me to record stories of my past which have been important in determining who I am now. Materializing these recollections, using different materials to encode emotions, resulted in significantly improving the perceived value of the final memory cues.

My goal of aiming at fostering reflection was supported especially by the overview possibilities offered by an abstract and symbolic visual language. Furthermore, the possibility to interact with the *Amarcordi*, sorting and organizing them, allowed me to gain new insight and perspective.

5.2 Future possibilities

As pointed out previously, certain technical aspects could be possibly further developed and improved. Finding faster solutions to finish and present an embroidery could give further incentive to record memories. More research and collaboration with industrial design experts could further develop the support of the embroideries and the way to store them in the home.

A direction I had to renounce, given this thesis scope, was designing a framework for other people to experiment with novel ways of recording their memories. There are many research possibilities in developing my artistic project in more approachable solutions for a wider public. I believe this could offer a chance for diverse applications, ranging from fostering personal wellbeing to aiding people with impaired cognitive capabilities, such as patients with Alzeihmer's disease.

Another aspect that could provide a further development of the project could be researching the value of adding a connection between *Amarcordi* and digital archives. I kept my work completely separated from the digital landscape with the clear objective of proceeding in steps. Given the controversial benefits of digital media, I decided to test innovative ways of recollecting to solve some of the issues that have been created, such as huge unsorted archives, maintaining a totally analogue solution.

My research indicated how new technologies have great potential, but also many uncontrollable drawbacks. The way I designed instructions to encode my memories, creating a repetitive process that follows a set of rules, does have a similar logic to that of a computer program and produces an output based on a grid, pattern repetition and variation just like creative coding (Montfort et al., 2013) suggesting the possibility to easily transform it into a digital experience.

However, using digital tools to generate the design of an *Amarcordi* based on an input story would have been an issue. Having a machine encoding the memory for me would have resulted in an easy loss of connection between abstract shapes and their meaning, since I could not even decipher hand drawn sketches after a couple of days. A slow manual work is necessary to bind pictograms and symbols to meaning. Employing digital knitting machines to produce the output would have created the same issue.

At the moment I do not see benefits in connecting *Amarcordi* to digital collections, but I do not exclude the possibility to experiment in this direction. However, I have collected insight that will prove valuable for new projects that wish to address the need to motivate memory curation. A series of observations from my analysis have in part confirmed assumptions I developed from the theory, but have also added new awareness to face this topic using design as a tool.

Firstly, I confirmed the need to remove the fatigue of selecting and organizing recollections creating a strong goal (Broekhuijsen et al., 2017; Jansen et al., 2013; Stevens et al., 2003). Even if my project complicates the process of choosing a single memory and representing it, it still feels more pleasant than sorting the infinite scroll of pictures saved on my smartphone. To create such a motivating output, it has to offer something common forms of recording do not have: addressing moments of recollection which are not *retrieving* (Broekhuijsen et al., 2017; Jansen et al., 2013; Sellen & Whittaker, 2010; Stevens et al., 2003).

I decided to encode emotions and feelings and I believe it could be an interesting approach also for digital tools. It is a functionality current digital collections lack at the moment and it could offer interesting grounds for innovation. While I can see the possibility to record such data through the use of sensors, I would advise caution in having a machine analyse such intimate details of our perception. Just like an algorithm was not the solution to create effective designs for *Amarcordi*, having one analyse emotions for us could not have the same beneficial effect of doing it by ourselves (Jose et al., 2012).

Lastly, while I have not found studies demonstrating harmful effects of hyper realistic memory, I do believe encouraging the development of more abstract forms of recording could be a new way of creating an overview of our past, offering the possibility to look back and form our identity (Sellen & Whittaker, 2010; van Dijck, 2007) in ways huge archives are not allowing us to do anymore (Axtell & Munteanu, 2017; Broekhuijsen et al., 2017; Sellen & Whittaker, 2010; Stevens et al., 2003).

To conclude, since memory curation is not only a way to understand who we are, but also where we are headed in the future, I believe it is important to keep experimenting towards creating healthier practices in this context. My path at Aalto MediaLab has given me the awareness to look with a critical eye at the behavioural patterns surrounding digital practices of memory collections. *Amarcordi* reflects how I did not learn from my studies how to be proficient in the use of a specific new media technique, but to mature a horizontal understanding of innovative technologies in order to design experiences for diverse fields and challenges. I will keep applying this knowledge to further design and analyse new ways of recording and curating memories.

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